WADE-8013
WADE-8014

Mini-ITX Board

User's Manual

Version 1.0

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Table of Contents

How to Use This Manual

Chapter 1 System Overview 1-1

1.1 Introduction 1-1
1.2 Check List 1-2
1.3 Product Specification 1-2
1.3.1 Mechanical Drawing 1-4
1.4 System Architecture 1-6

Chapter 2 Hardware Configuration 2-1

2.1 Jumper Setting 2-1
2.2 Connector Allocation 2-3

Chapter 3 System Installation 3-1

3.1 Intel LGA-1155 Processor 3-1
3.2 Main Memory 3-4
3.3 Installing the Single Board Computer 3-5
3.3.1 Chipset Component Driver 3-5
3.3.2 Intel® Integrated Graphics Controller 3-5
3.3.3 On-board Gigabit Ethernet Controller 3-5
3.3.4 Audio Controller 3-6
3.4 Clear CMOS Operation 3-6
3.5 WDT Function 3-6
3.6 GPIO 3-8

Chapter 4 BIOS Setup Information 4-1

4.1 Entering Setup -- Launch System Setup 4-1
4.2 Main 4-2
4.3 Advanced 4-3
4.4 Security 4-26
4.5 Boot 4-27
4.6 Exit 4-28

Chapter 5 Troubleshooting 5-1

5.1 Hardware Quick Installation 5-1
5.2 BIOS Setting 5-3
5.3 Q&A 5-4

How to Use This Manual

The manual describes how to configure your WADE-8013/WADE-8014 system board to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Host Board.

Chapter 1: System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single host board.

Chapter 2: Hardware Configuration. Show the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3: System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4: BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5: Troubleshooting. Provide various of useful tips to quickly get WADE-8013/WADE-8014 running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. The vendor may make supplement or change in the products described in this document at any time.

Chapter 1
System Overview

1.1 Introduction

Portwell Inc., a world-leading innovator in the Industrial PC (IPC) market and a member of the Intel® Embedded and Communications Alliance (Intel ECA), announced today the Portwell WADE-8013/WADE-8014 adopting the Mini-ITX form factor. The WADE-8013/WADE-8014 of the Intel platform will provide high performance and flexibility for functional expansion, such as Gaming, Kiosk, DS, Medical, Defense, Industrial automation and control applications.

Ivy Bridge is the next major architecture from Intel. The WADE-8013/WADE-8014 supports the latest Intel® Ivy Bridge processors in LGA1155 package which has memory and PCI Express controller integrated to support 2-channel DDR3 memory and PCI Express 3.0 lanes providing great graphics performance. Intel® Ivy Bridge processor is one of the most powerful and energy efficient CPU in the world. Portwell have taken advantage of such technology to furnish a series of products that can meet multiple industrial requirements such as cost-effective of CPU performance or industrial systems.

WADE-8013/WADE-8014 is based on the Intel Ivy Bridge processor and Intel® Q77/C216 chipset. The Intel Q77/C216 Express Chipset, when combined with a processor from the Intel® Dual Core/Quad Core processor family, delivers smart security, cost saving manageability, and intelligent performance for business platforms. WADE-8013/WADE-8014 is the first Portwell off-the-shelf product for by Intel® Q77/C216 Express Chipset, it can be an embedded solution and a good platform for customer to integrate it to the embedded system.

WADE-8013/WADE-8014 showcased one of Portwell upcoming motherboard for the Intel's Ivy Bridge processors . The WADE-8013/WADE-8014 is based on the forthcoming Intel Q77/C216 chipset and supports the new LGA 1155 socket (socket that will be used by Ivy Bridge processors). This board has lots of features, including supports total 4x SATA (two SATA 6.0 Gbps and two 3.0 Gbps ports)storage specification , allows RAID 0/1/5 and 10. supports the latest PCIe 3.0 (one PCI-Express x16 slot) devices for double speed and bandwidth which enhances system performance, two long-DIMM memory slot for DDR3 SDRAM up to 16GB, support total 10 USB2.0 ports (4x rear IO by USB3.0 / 6x on board by USB2.0), VGA / HDMI / DVI-D , two Gigabit Ethernet and one mini-PCIe slot support mSATA.

1.2 Check List

The WADE-8013/WADE-8014 package should cover the following basic items

- ✓ One WADE-8013/WADE-8014 Mini-ITX Main Board
- ✓ One SATA Cable
- ✓ One I/O Shield bracket
- ✓ One Installation Resources CD-Title

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

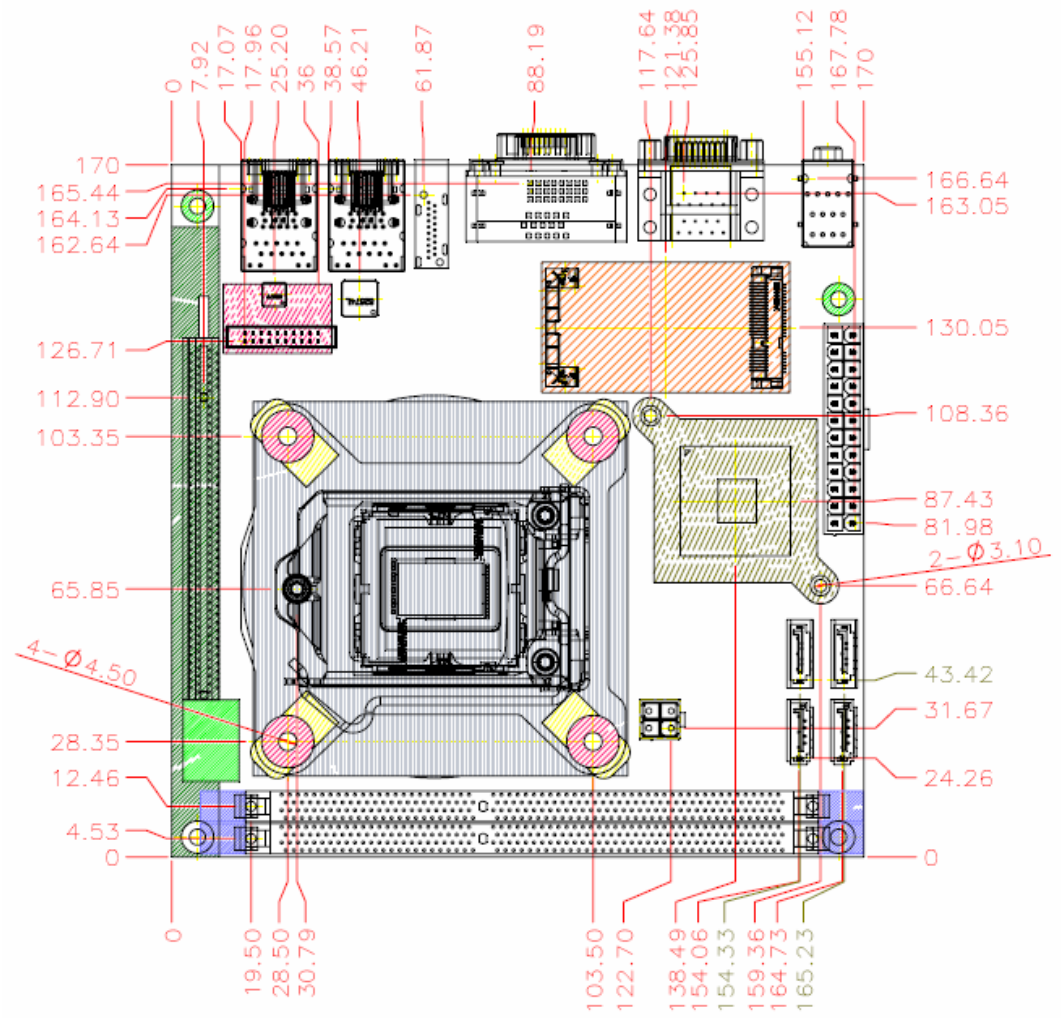
- **Main Processor**
  -Intel® Dual Core/Quad Core LGA1155 processor
  -CPU clock bus: 1333/1600 MHz
- **Chipset**
  -Intel® Q77 chipset(WADE-8013)
  -Intel® C216 chipset(WADE-8014)
- **System BIOS**
  -Phoenix BIOS
- **Main Memory**
  -Two 204 -pin DDR3 SODIMM socket support up to 16GB dual channel 1333/1600 MHz memory
- **Expansion Interface**
  -One PCIex16
  -One Mini-PCIe slot(support mSATA))
- **SATA Interface**
  -Four SATA ports(2x SATA 6Gb/2x SATA 3Gb)
- **Serial Port**
  -Support total six comports(one RS232 and one RS232/422/485 on rear S/O three RS232 and one RS232/422/485 on board header)
- **USB Interface**
  -Support Ten USB (Universal Serial Bus) ports, four on rear I/O and Six on board header for internal devices

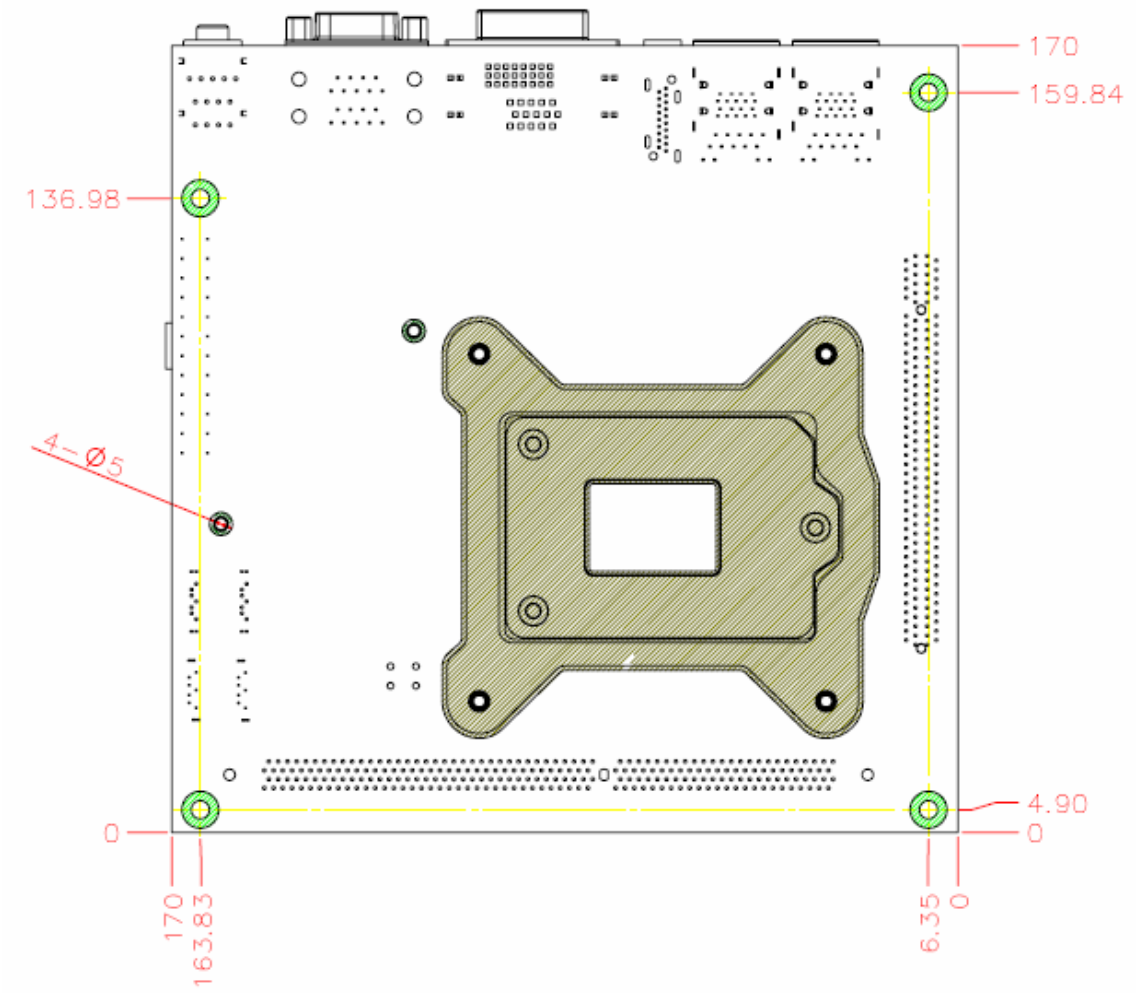
- **Audio Interface**
  -Connector for Mic-In, Line-In and Line-Out
- **Real Time Clock/Calendar (RTC)**
  -Support Y2K Real Time Clock/Calendar
- **Watch Dog Timer**
  -Support WDT function through software programming for enable/disable and interval setting
  -General system reset
- **On-board Ethernet LAN**
  -Two Gigabit Ethernet (10/100/1000 Mbits/sec) LAN ports using Intel 82579LM & 82583V GbE Ethernet Controller
- **High Drive GPIO**
  -One pin-header for 16 bit GPIO (8bit in & 8bit out)
- **System Monitoring Feature**
  -Monitor system temperature and major power sources.
- **Outline Dimension (L x W)**
  -170mm(6.69'') x 170mm(6.69'')
- **Power Requirements**
  Configuration

CPU Type	Intel(R) Core(TM) i5-3550 CPU @3.30GHz Level 3 6MBytes
SBC BIOS	Portwell,Inc.WADE-8013/WADE-8014 TEST BIOS (21101T00)
VGA Card	ONBOARD Intel(R)HD Graphics
VGA Driver	Intel(R)HD Graphics Version:9.17.10.2828
LAN Card	ONBOARD Intel(R) 825741L Gigabit Network Connection
LAN Driver	Intel(R) 825741L Gigabit Network Connection Version:11.17.27.0
LAN Card	ONBOARD Intel(R) 82579LM Gigabit Network Connection
LAN Driver	Intel(R) 82579LM Gigabit Network Connection Version:11.16.96.0
Audio Card	ONBOARD Realtek ALC886 High Definition Audio
Audio Driver	Realtek ALC886 High Definition Audio Version:6.0.1.6602
Chip Driver	Intel(R) Chipset Device Software Version:9.3.0.1021
USB3.0 Driver	Intel(R) USB3.0 eXtensible Host Controller Version:1.0.5.235
SATA HDD	Seagate ST380815AS 80GB
Power Supply	EMACS HG2-6350P

- **Operting Temperature**
  0 °C ~ 60 °C
- **Storage Temperature**
  -20 ~ 80 °C
- **Relative Humidity**
  0% ~ 90%, non-condensing

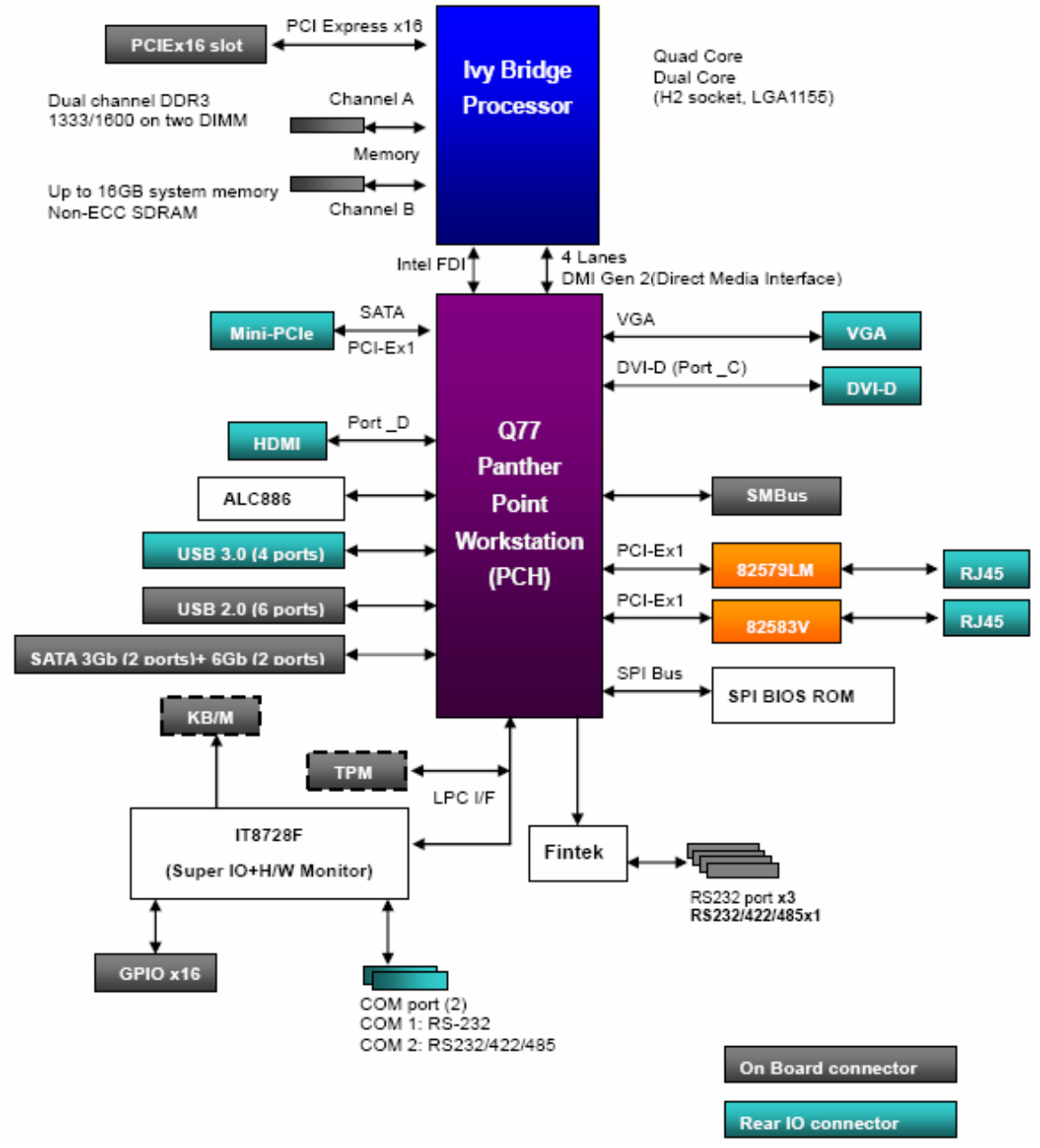
1.3.1 Mechanical Drawing




170
159.84
136.98
4-Ø5
4.90
0
0
170
163.83
6.35
0

1.4 System Architecture

All of details operating relations are shown in WADE-8013 System Block Diagram. (WADE-8014 's PCH is C216,support ECC memory)



WADE-8013/WADE-8014 System Block Diagram

Chapter 2
Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connectors. All of the configuration jumpers on WADE-8013/WADE-8014 are in the proper position. The default settings shipped from factory are marked with an asterisk (♣).

2.1 Jumper Setting

In general, jumpers on the single board computer are used to select options for certain features. Some of the jumpers are designed to be user-configurable, allowing for system enhancement. The others are for testing purpose only and should not be altered. To select any option, cover the jumper cap over (SHORT) or remove (NC) it from the jumper pins according to the following instructions. Here NC stands for "Not Connect".

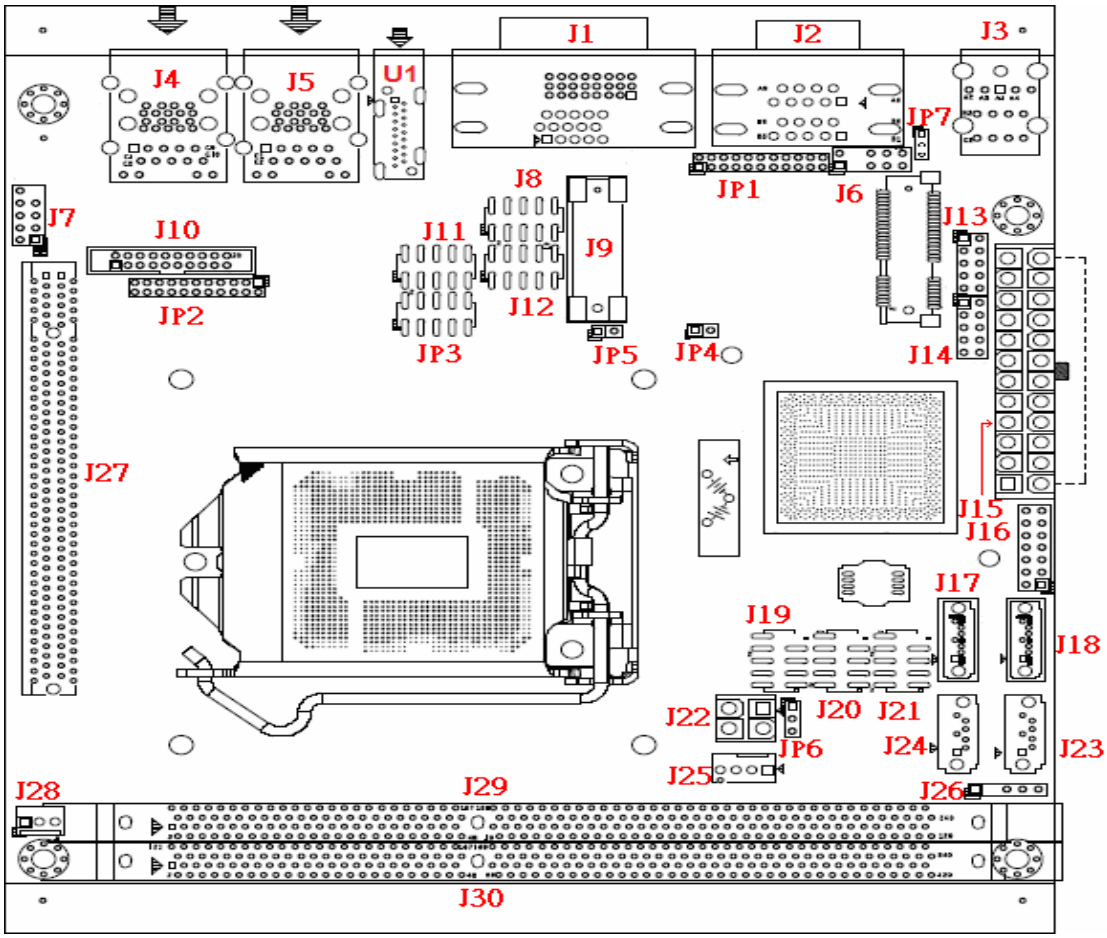


Figure 2-1 WADE-8013 / WAD-8014 Jumper and Connector Locations

The jumper settings are schematically depicted in this manual as follows:
★ **is mean default**

JP1: COM2 function Selection

JP1	Function
5-6, 9-11, 10-12, 15-17, 16-18 Short	RS-232
3-4, 7-9, 8-10, 13-15, 14-16, 21-22 Short	RS-422
1-2, 7-9, 8-10, 19-20 Short	RS-485

JP2: COM6 function Selection

JP2	Function
5-6, 9-11, 10-12, 15-17, 16-18 Short	RS-232
3-4, 7-9, 8-10, 13-15, 14-16, 21-22 Short	RS-422
1-2, 7-9, 8-10, 19-20 Short	RS-485

JP3: COM4 Serial Port Pin Header

PIN No.	Signal Description
1	DCD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	Ground
10	N/C

JP4:AUTO POWER BUTTON Select

JP4	Function
Short	Auto power button enable
Open	Auto power button disable

JP5: PCIE Select

JP5	Function
Short[1 0]	2 x8 PCI Express
Open[1 1]	1 x16 PCI Express

2x8 PCI Express for C216 Chipset

JP6: CMOS Clear

JP6	Function
1-2 Short	Normal Operation
2-3 Short	Clear CMOS Contents

JP7: mSATA/miniPCIE

JP7	Function
1-2 Short	mSATA
2-3 Short	Mini PCIE

2.2 Connector Allocation

I/O peripheral devices and Flash disk will be connected to these interface connectors

Connector Function List

Connector	Function	Remark
J1	VGA+DVI-D Connector	
J2	Serial Port 0、1 Connector	
J3	Audio Connector	
J4	RJ-45&USB 3.0x2 Connector 82579LM	
J5	RJ-45&USB 3.0x2 Connector 82574L	
J6	PS/2 Keyboard/Mouse Pin Header	
J7	LPC debug Pin HEADER	
J8	Serial Port 5 Pin Header	
J9	MiniPCIE/mSATA Connector	
J10	TPM Pin Header	
J11	Serial Port 6 Pin Header	
J12	Serial Port 3 Pin Header	
J13	GPIO Pin Header	
J14	GPIO Pin Header	
J15	ATX Power Connector	
J16	Front Panel Pin Header	
J17/J18	SATA 2.0 Connector	
J19/J20/J21	USB 2.0 Pin Header	
J22	+12V Power Connector	
J23/J24	SATA 3.0 Connector	
J25	FAN (CPU FAN) Power Connector	
J26	SMBUS Pin HEADER	
J27	PCIEx16 Slot	
J28	FAN (SYSTEN FAN) Power Connector	
J29/J30	DDR3 Slot	
U1	HDMI Connector	

J1:VGA+DVI-D Connector

J1A: DVI-D Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	D2-	2	D2
3	SHIELD1	4	D4-
5	D4	6	DDCCLK
7	DDCDATA	8	NC
9	D1-	10	D1
11	DHIELD2	12	D3-
13	D3	14	VCC5
15	GND	16	HPDET
17	D0-	18	D0
19	SHIELD3	20	D5-
21	D5	22	SHIELD4
23	CLK	24	CLK-
CG1	CG1	CG2	CG2

J1B: VGA Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Red	2	Green
3	Blue	4	NC
5	GND	6	RGND
7	GGND	8	BGND
9	KEY(+5V)	10	SGND
11	NC	12	SDA
13	H Sync	14	V Sync
15	SCL	16	

J2: COM1&COM2

J2A:COM1 Serial Port

PIN No.	Signal Description
1	DCD#1
2	RXD#1
3	TXD#1
4	DTR#1
5	GND
6	DSR#1
7	RTS#1
8	CTS#1
9	RI#1

J2B:COM2 Serial Port

PIN No.	Signal Description
1	DCD#2/DT-
2	RXD#2/DT+
3	TXD#2/422R+
4	DTR#2/422R-
5	GND
6	DSR#2
7	RTS#2
8	CTS#2
9	RI#2

J6:PS/2 Keyboard/Mouse Pin Header

PIN No.	Signal Description	PIN No.	Signal Description
1	Mouse Data	2	Keyboard Data
3	N/C	4	N/C
5	Ground	6	Ground
7	PS2 Power	8	PS2 Power
9	Mouse Clock	10	Keyboard Clock

J8:COM5 Serial Port Pin Header

PIN No.	Signal Description
1	DCD#5
2	DSR#5
3	RXD#5
4	RTS#5
5	TXD#5
6	CTS#5
7	DTR#5
8	RI#5
9	Ground
10	N/C

J10: TPM Pin Header

PIN No.	Signal Description	PIN No.	Signal Description
1	PCLK_TPM	2	GND
3	LFRAME#	4	X
5	SIO2_PLTRST#	6	VCC
7	LAD3	8	LAD2
9	VCC3	10	LAD1
11	LAD0	12	GND
13	SMB_CLK_MAIN	14	SMB_DATA_MAIN
15	3VSB	16	SERIRQ
17	GND	18	X
19	LPCPD#	20	X

J11: Serial Port 6 Pin Header

PIN No	Signal Description		
	RS-232	RS-422	RS-485
1	DCD (Data Carrier Detect)	TX-	DATA-
2	DSR (Data Set Ready)	N/C	N/C
3	RXD (Receive Data)	TX+	DATA+
4	RTS (Request to Send)	N/C	N/C
5	TXD (Transmit Data)	RX+	N/C
6	CTS (Clear to Send)	N/C	N/C
7	DTR (Data Terminal Ready)	RX-	N/C
8	RI (Ring Indicator)	N/C	N/C
9	GND (Ground)	GND	GND
10	N/C	N/C	N/C

J12:COM3 Serial Port Pin Header

PIN No.	Signal Description
1	DCD#3
2	DSR#3
3	RXD#3
4	RTS#3
5	TXD#3
6	CTS#3
7	DTR#3
8	RI#3
9	Ground
10	N/C

J13: GPIO Pin Header

PIN No.	Signal Description	PIN No.	Signal Description
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	Ground	10	+5V

J14: GPIO Pin Header

PIN No.	Signal Description	PIN No.	Signal Description
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	Ground	10	+5V

J16: Front Panel Pin Header

PIN No.	Signal Description	PIN No.	Signal Description
1	VCC	2	5VSB
3	SATA_LED#	4	POWER_LED
5	GND	6	Power Button#
7	RSTBTN#	8	GND
9	VCC	10	BUZZER
11	GND	12	GND
13	VCC	14	NC

1-3 SATA LED、2-4 Power LED

5-7 Reset Button、6-8 Power Button、9-10 Buzzer

J19/J20/J21/:USB2.0 Pin Header

PIN No.	Signal Description	PIN No.	Signal Description
1	5V Dual	2	5V Dual
3	USB-	4	USB-
5	USB+	6	USB+
7	Ground	8	Ground
	Key	10	N/C

J25: CPU Fan Connector

PIN No.	Signal Description
1	Ground
2	+12V
3	Sense output
4	FAN PWM_CONTROL

J26: SMBUS Pin Header

PIN No.	Signal Description
1	SMBus_CLK
2	N/C
3	Ground
4	SMBus_DAT
5	+5V

J28: System Fan Connector

PIN No.	Signal Description
1	Ground
2	FAN PWM_CONTROL
3	Sense output

U1: HDMI Connector

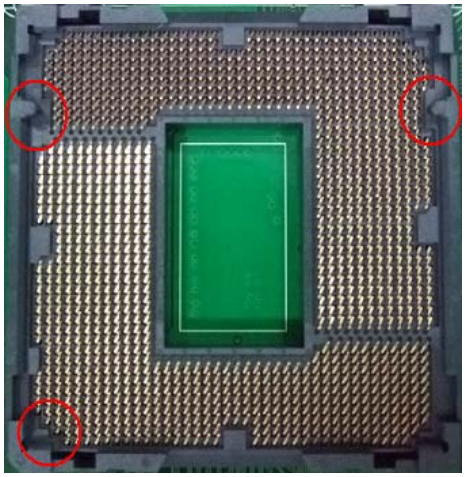
PIN No.	Signal Description	PIN No.	Signal Description
1	TMDA Data2+	2	Data2 Shield Ground
3	TMDA Data2–	4	TMDA Data1+
5	Data1 Shield Ground	6	TMDA Data1–
7	TMDA Data0+	8	Data0 Shield Ground
9	TMDA Data0–	10	TMDA Clock+
11	Clock Shield Ground	12	TMDA Clock–
13	CEC	14	Reserved
15	SCL	16	SDA
17	DDC/CEC Ground	18	+5V Power
19	Hot Plug Detect		

Chapter 3
System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

3.1 Intel LGA-1155 Processor

LGA-1155 CPU Socket



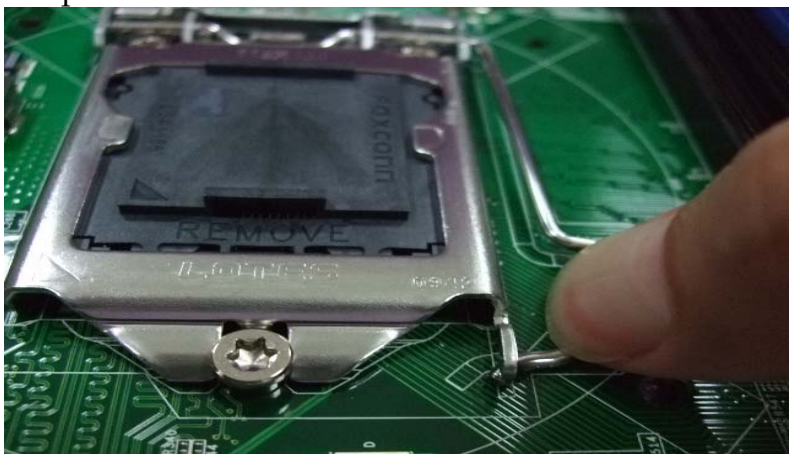
LGA-1155 CPU

Please remember to locate the alignment keys on the CPU socket of the motherboard and the notches on the CPU.

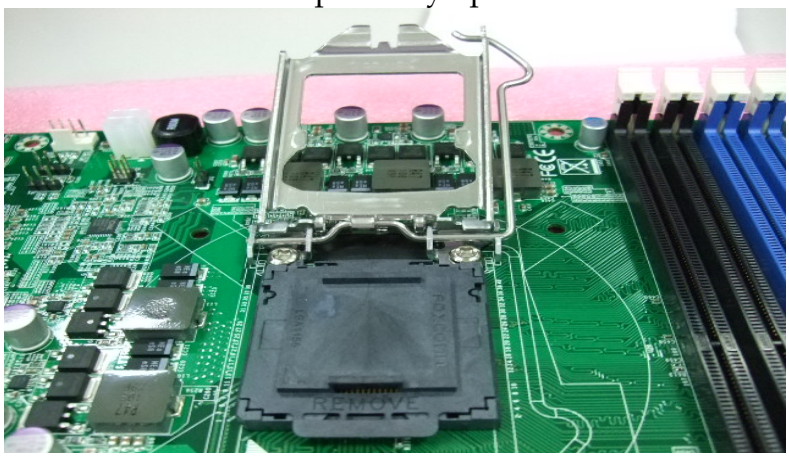
LGA-1155 CPU Installation Steps

Before install the CPU, please make sure to turn off the power first!

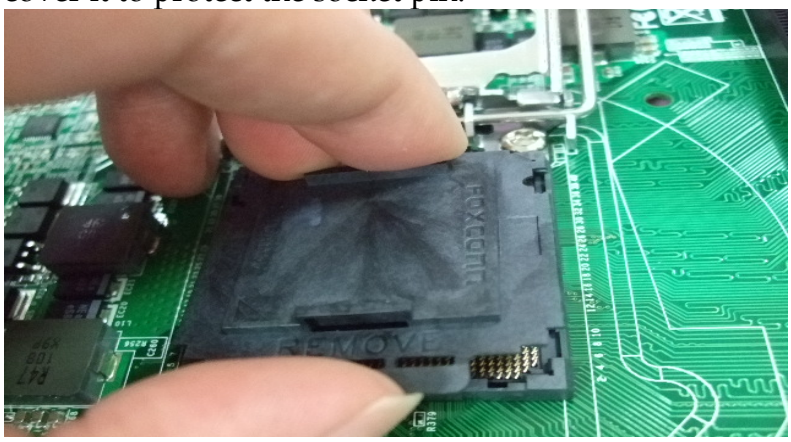
1. Open the load lever.



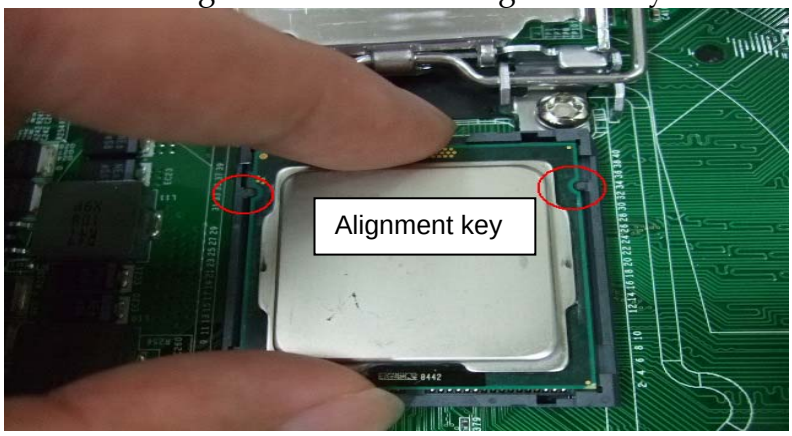
2. Lift the load lever up to fully open.



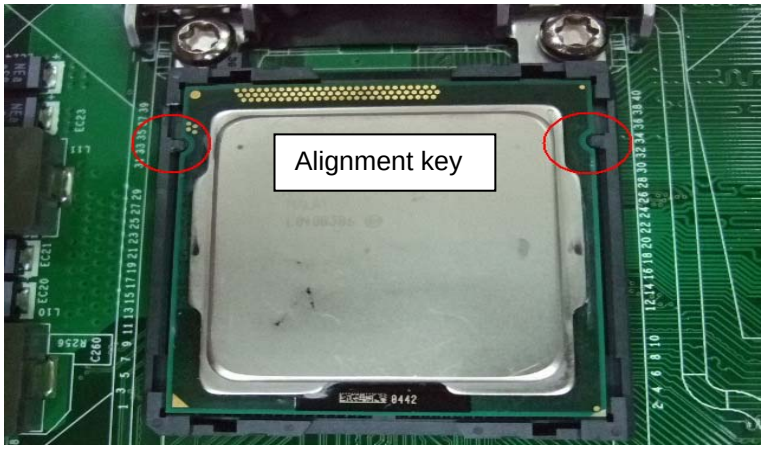
3. Remove the plastic cap on the CPU socket. Before you install the CPU, always cover it to protect the socket pin.



4. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Note that alignment keys are matched.



5. Make sure the CPU has been seated well into the socket. If not, take out the CPU and reinstall.



6. Engage the load lever while pressing down lightly onto the load plate.

7. Push the CPU socket lever back into its locked position

8. Please make sure four hooks are in proper position before you install the cooler.

3.2 Main Memory

WADE-8013/WADE-8014 has two 240 pin DIMM sockets which supports Dual channel 1333/1600 DDR3-SDRAM as main memory, Non-ECC (Error Checking and Correcting), non-register functions. The maximum memory can be up to 16GB. Memory clock and related settings can be detected by BIOS via SPD interface.

For system compatibility and stability, do not use memory module without brand. Memory configuration can be set to either one double-sided DIMM in one DIMM socket or two single-sided DIMM in both sockets.

Beware of the connection and lock integrity from memory module to socket. Inserting improperly it will affect the system reliability.

Before locking, make sure that all modules have been fully inserted into the card slots.

Note:

To insure the system stability, please do not change any of DRAM parameters in BIOS setup to modify system the performance without acquired technical information.

3.3 Installing the Single Board Computer

To install your WADE-8013/WADE-8014 into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position

Step 2 : Install and configure CPU and memory module on right position
Step 3 : Place WADE-8013/WADE-8014 into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

WARNING

Please ensure that SBC is properly inserted and fixed by mechanism.

Note:

Please refer to section 3.3.1 to 3.3.4 to install INF/VGA/LAN/Audio drivers.

3.3.1 Chipset Component Driver

WADE-8013/WADE-8014 uses Intel® Q77 Platform Controller Hub (PCH). It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 7, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in WADE-8013/WADE-8014 CD-title.

3.3.2 Intel® Integrated Graphics Controller

WADE-8013/WADE-8014 uses Intel® PCH integrated graphic chipset to gain an outstanding graphic performance. WADE-8013/WADE-8014 supports VGA, DVI-D, and HDMI display output. It can select two of them to use dual display function. This combination makes WADE-8013/WADE-8014 an excellent piece of multimedia hardware.

Drivers Support
Please find the Graphic drivers in the WADE-8013/WADE-8014 CD-title. Drivers support, Windows 7.

3.3.3 On-board Gigabit Ethernet Controller

Drivers Support
Please find Intel 82579LM and 82583V LAN driver in /Ethernet directory of WADE-8013/WADE-8014 CD-title. The drivers support Windows 7.

3.3.4 Audio Controller

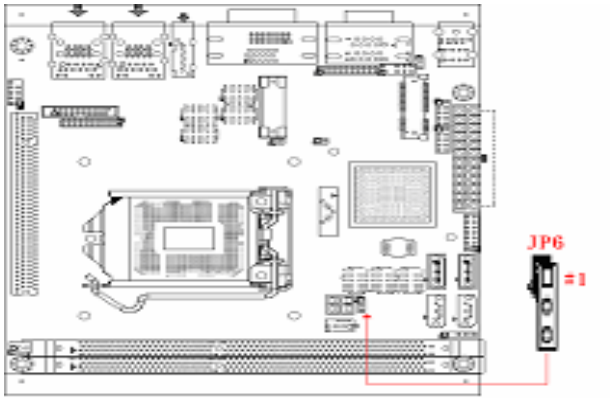
Please find Realtek ALC886 (High Definition Audio driver) form WADE-8013/WADE-8014 CD-title. The drivers support Windows 7.

3.4 Clear CMOS Operation

The following table indicates how to enable/disable Clear CMOS Function hardware circuit by putting jumpers at proper position.

JP6: CMOS Clear

JP6	Function
1-2 Short	Normal Operation
2-3 Short	Clear CMOS Contents



3.5 WDT Function

The Watchdog Timer of motherboard consists of 8-bit programmable time-out counter and a control and status register.

WDT Controller Register

There are two PNP I/O port addresses that can be used to configure WDT,
(1) 0x2E:EFIR (Extended Function Index Register, for identifying CR index number)
(2) 0x2F:EFDR (Extended Function Data Register, for accessing desired CR)

WDT Control Mode Register

The working algorithm of the WDT function can be simply described as a counting process. The Time-Out Interval can be set through software programming. The availability of the time-out interval settings by software or hardware varies from boards to boards.

WADE-8013/WADE-8014 allows users to control WDT through dynamic software programming. The WDT starts counting when it is activated. It sends out a signal to system reset or to non-maskable interrupt (NMI), when time-out interval ends. To prevent the time-out interval from running out, a re-trigger signal will need to be sent before the counting reaches its end. This action will restart the counting process. A well-written WDT program should keep the counting process running under normal condition. WDT should never generate a system reset or NMI signal unless the system runs into troubles.

The related Control Registers of WDT are all included in the following sample program that is written in C language. User can fill a non-zero value into the Time-out Value Register to enable/refresh WDT. System will be reset after the Time-out Value to be counted down to zero. Or user can directly fill a zero value into Time-out Value Register to disable WDT immediately. To ensure a successful accessing to the content of desired Control Register, the sequence of following program codes should be step-by-step run again when each register is accessed.

Additionally, there are maximum 2 seconds of counting tolerance that should be considered into user' application program. For more information about WDT, please refer to ITE IT8728F data sheet.

WDT Control Command Example

```
#include <stdio.h>
#include <conio.h>
#include <dos.h>

#define SIO_Port 0x2E
#define  SIO_Port2          0x4E
#define GPIO_LDN          0x07

void Enter_IT872x_SIO() {
        outportb(SIO_Port, 0x87);
        outportb(SIO_Port, 0x01);
        outportb(SIO_Port, 0x55);
        outportb(SIO_Port, 0x55);

}

void Set_LDN(unsigned char LDN) {
        outportb(SIO_Port, 0x07);
        outportb(SIO_Port+1, LDN);
        printf("LDN=%x\n", LDN);
}
```

```
void Set_Register(unsigned char offset, unsigned char value) {
        outportb(SIO_Port, offset);
        outportb(SIO_Port+1, value);
        printf("Write offset:%x = %x\n", offset, value);
}

int main(void) {

        printf("test string\n");
        Enter_IT872x_SIO();
        Set_LDN(GPIO_LDN);

        Set_Register(0x72, 0xC0);
        Set_Register(0x73, 0x05);
        printf("System will reset in 5 seconds\n");

        return 0;
}
```

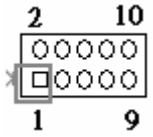
3.6 GPIO

The motherboard provides two groups of 8 input / output ports that can be individually configured to perform a simple basic I/O function.

GPIO Pin Assignment
The WADE-8013 provides two groups of 8 input / output ports that can be individually configured to perform a simple basic I/O function. Users can configure each individual port to become an input or output port by programming register bit of I/O Selection. To invert port value, the setting of Inversion Register has to be made. Port values can be set to read or write through Data Register.
The GPIO port is located on J13 & J14 shown as follows. Please note:
Do not short the Pin 9 and Pin 10 of the J13 & J14!

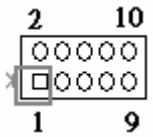
The control for the GPIO signals is handled through a separate 2-byte I/O space.

J13: GPIO



PIN No.	Signal Description	PIN No.	Signal Description
1	LPC_GP77	2	LPC_GP73
3	LPC_GP76	4	LPC_GP72
5	LPC_GP75	6	LPC_GP71
7	LPC_GP74	8	LPC_GP70
9	GND	10	Vcc

J14: GPIO



PIN No.	Signal Description	PIN No.	Signal Description
1	LPC_GP87	2	LPC_GP83
3	LPC_GP86	4	LPC_GP82
5	LPC_GP85	6	LPC_GP81
7	LPC_GP84	8	LPC_GP80
9	GND	10	Vcc

GPIO Control Command Example

```
#define GPIO_SEL_13

#if         GPIO_SEL_13
            #define  GPIO_MODE      0xCE  // GPIO13 (J13)
#else
            #define  GPIO_MODE      0xCF  // GPIO14 (J14)
#endif


static void set_ite_cfg (unsigned char Addr,unsigned char Value)
{
            write_io_byte (0X2E, Addr);
            write_io_byte (0X2E + 1, Value);
}

static unsigned char get_ite_cfg (unsigned char Addr)
```

```
{
        unsigned char data;
        write_io_byte(0X2E, Addr);
        read_io_byte(0X2E + 1, &data);
        return data;
}

  enter_ite_superio_cfg ();

// initial register state
  set_ite_cfg (0x07, 0x03);  // Select LDN = 0x03h
  set_ite_cfg (0x30, 0x00);

        set_ite_cfg (0x07, 0x07);     // Select LDN = 0x07h
#if     GPIO_SEL_13
        data = get_ite_cfg  (0xE9);
        data = data | 0x20;          // bit 5 set 1
        set_ite_cfg (0xE9, data);
#else
        data = get_ite_cfg  (0x2C);
        data = data | 0x80;          // bit 7 set 1
        set_ite_cfg (0x2C, data);
#endif

        // read GPIO base address
        bar_msb = get_ite_cfg (0x62);
        bar_lsb = get_ite_cfg (0x63);
        BASE = (bar_msb << 8) | bar_lsb;


        // 1 -> out, 0 -> in
        // GPIO 1~4 is out, 5~8 is in
  set_ite_cfg (GPIO_MODE, 0xF0); // 7~4:PIN 1~4, 3~0: PIN 5~8

#if     GPIO_SEL_13
  // Set GP70~73 Low, 74~77 High
  write_io_byte (BASE + 6, 0x0F);  // GPIO13
  read_io_byte (BASE + 6, &data); // BASE + 6 = GPIO13
#else
  // Set GP80~83 Low, 84~87 High
  write_io_byte (BASE + 7, 0x0F);  // GPIO14
  read_io_byte (BASE + 7, &data); // BASE + 6 = GPIO14
#endif
```

Chapter 4
BIOS Setup Information

WADE-8013/WADE-8014 is equipped with the Phoenix BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, WADE-8013/WADE-8014 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

4.1 Entering Setup -- Launch System Setup

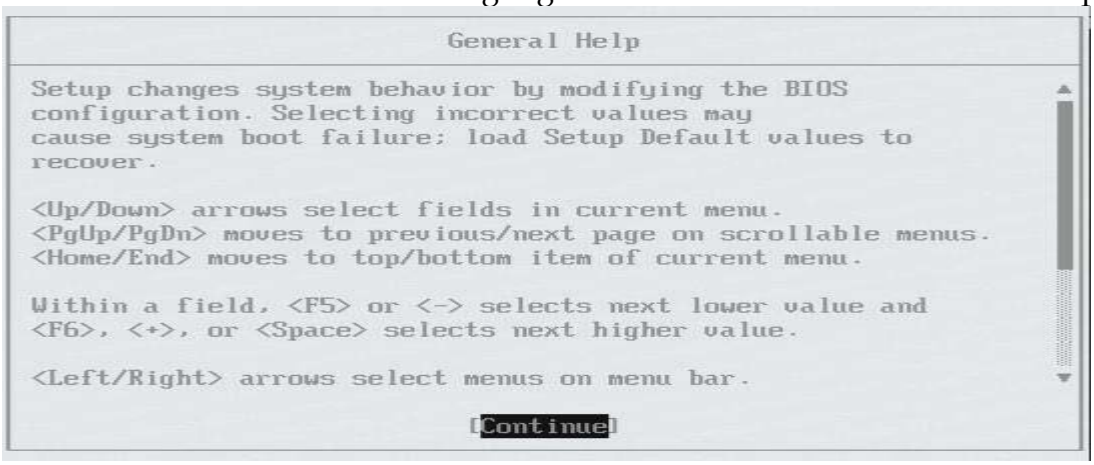
Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <Del> key will enter BIOS setup screen.

Press <Del> to enter SETUP

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

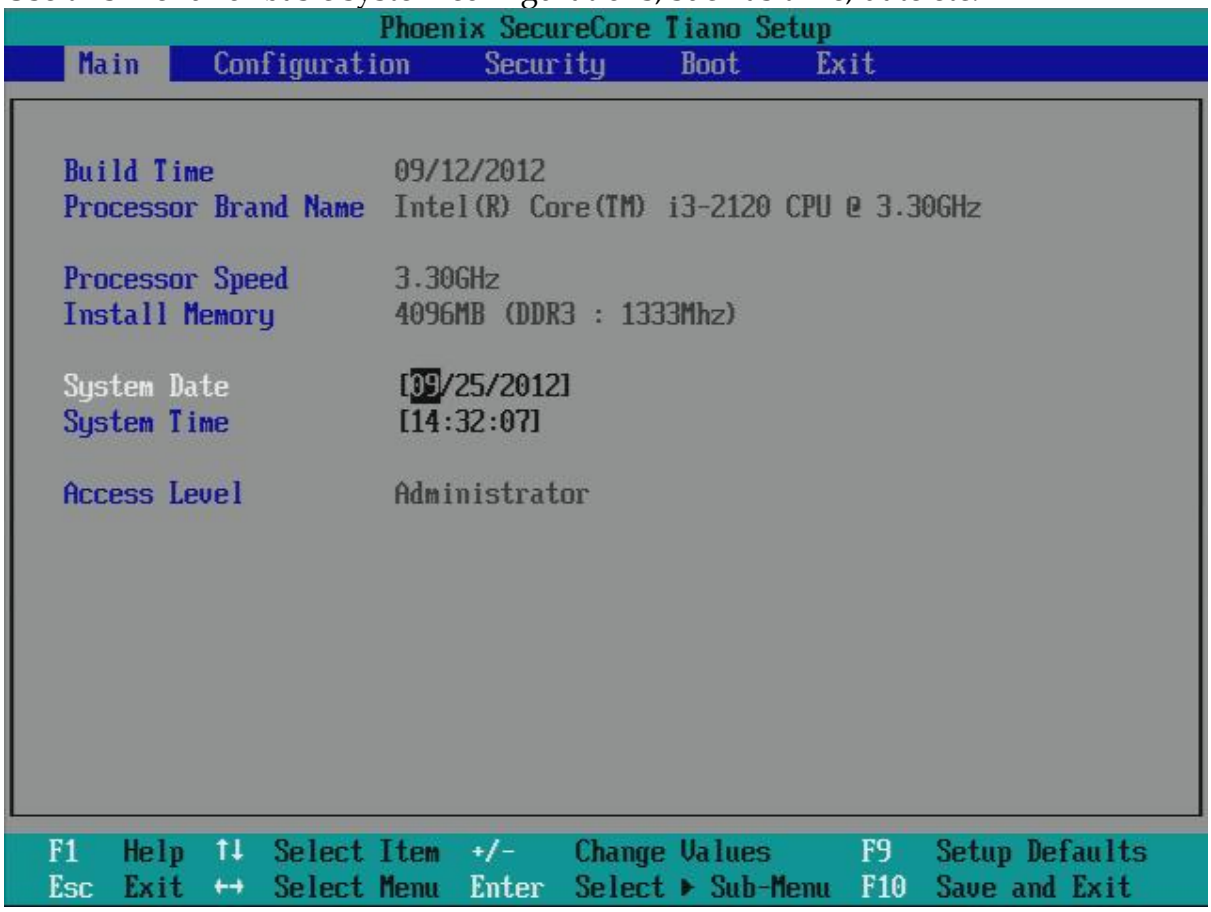
Press <F1> to Run SETUP or Resume

The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help screen.



4.2 Main

Use this menu for basic system configurations, such as time, date etc.



System Date

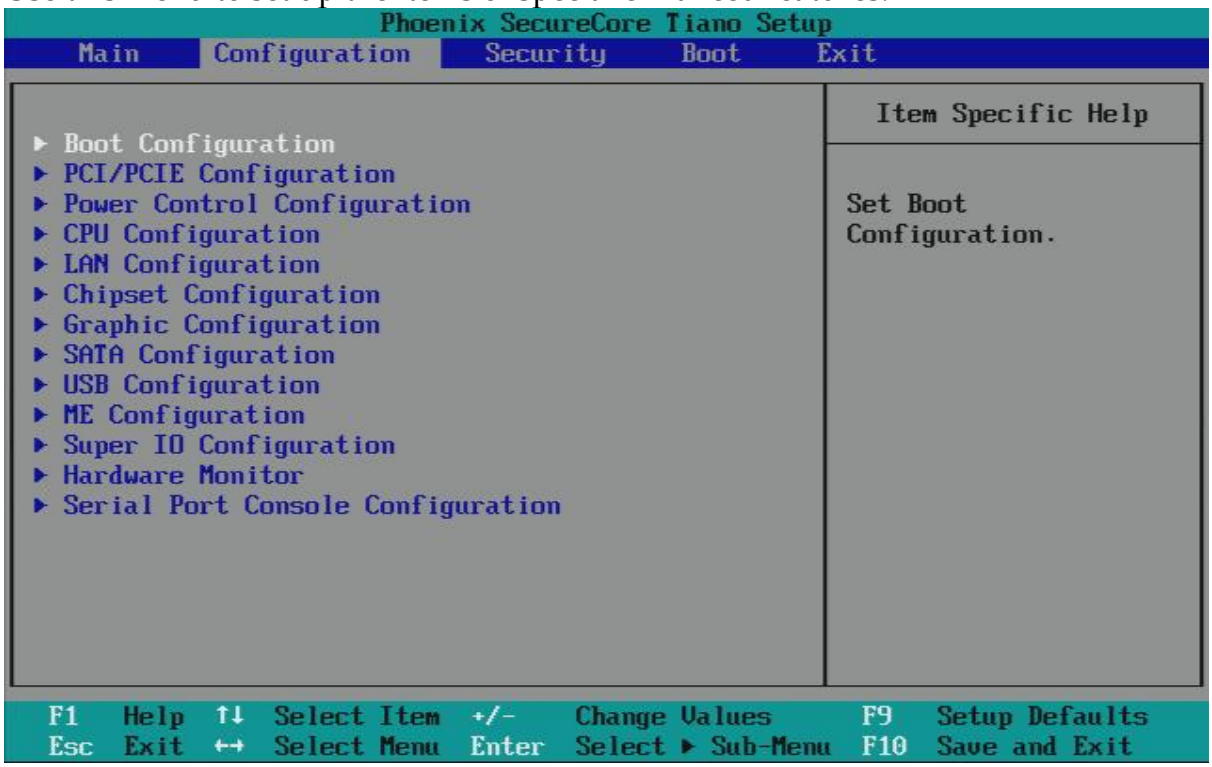
The date format is <Day>, <Month> <Date> <Year>. Use [+] or [−] to configure system Date.

System Time

The time format is <Hour> <Minute> <Second>. Use [+] or [−] to configure system Time.

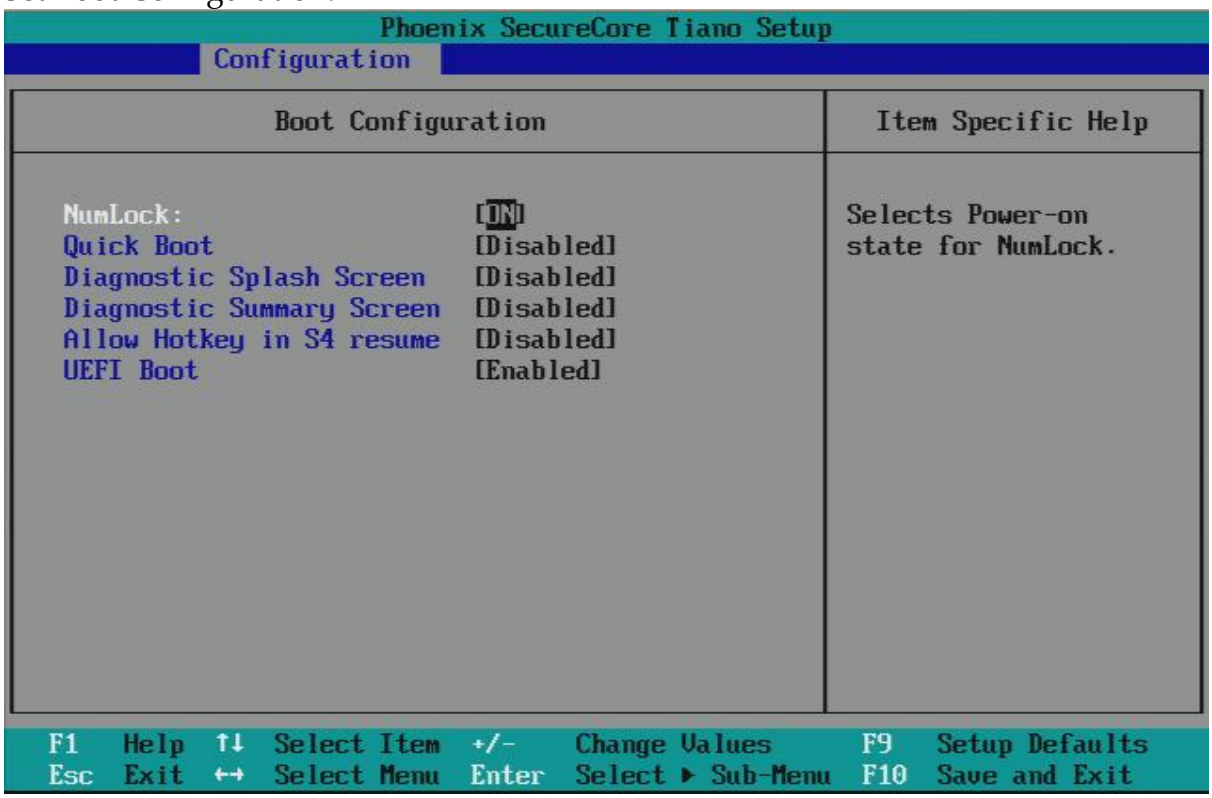
4.3 Advanced

Use this menu to set up the items of special enhanced features.



Boot Configuration

Set Boot Configuration.


Phoenix SecureCore Tiano Setup
Configuration
Boot Configuration
Item Specific Help
NumLock: [ON]
Quick Boot [Disabled]
Diagnostic Splash Screen [Disabled]
Diagnostic Summary Screen [Disabled]
Allow Hotkey in S4 resume [Disabled]
UEFI Boot [Enabled]
Selects Power-on state for NumLock.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

NumLock:
Selects Power-on state for NumLock.
Choices: OFF, ON.

Quick Boot
Enable/Disable quick boot.
Choices: Disabled, Enabled.

Diagnostic Splash Screen
If you select 'Enabled' the diagnostic splash screen always displays during boot. If you select 'Disabled' the diagnostic splash screen does not displays unless you press HOTKEY during boot.

Choices: Disabled, Enabled.

Diagnostic Summary Screen
Display the Diagnostic summary screen during boot.

Choices: Disabled, Enabled.

Allow Hotkey in S4 Resume
Enable hotkey detection when system resuming from Hibernate state.

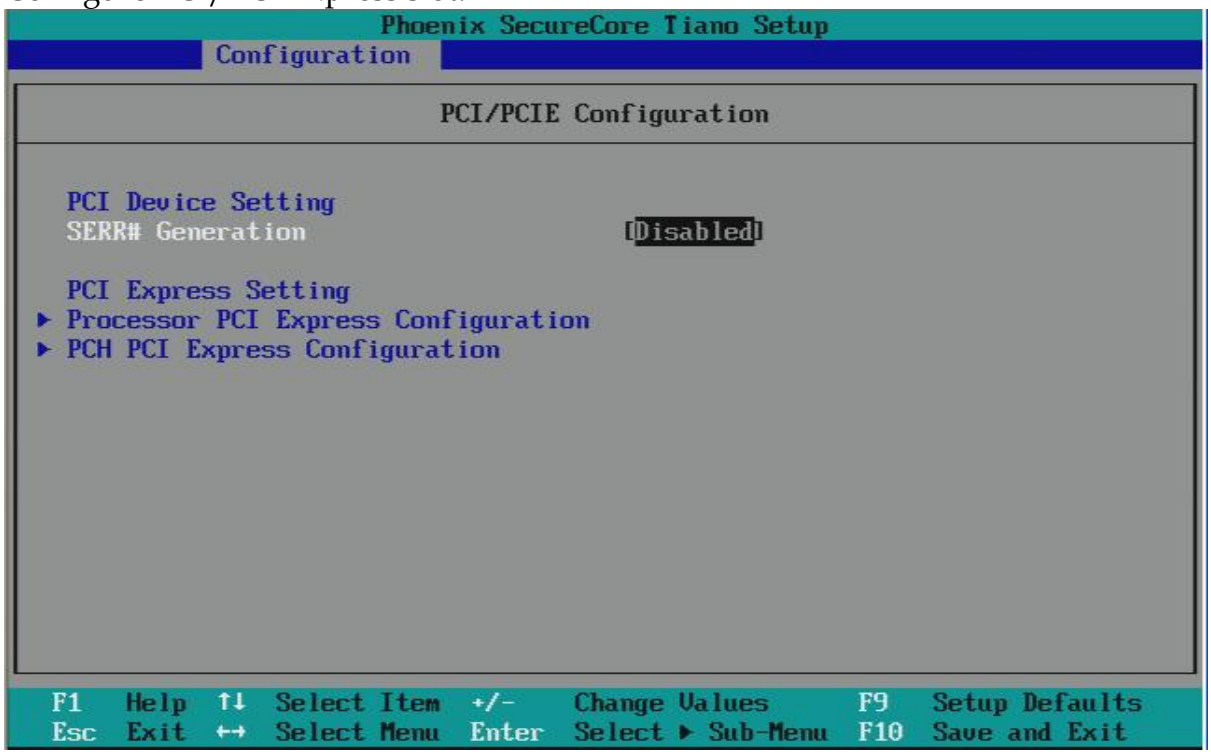
Choices: Disabled, Enabled.

UEFI Boot
Enable the UEFI boot.

Choices: Disabled, Enabled.

PCI/PCIE Configuration

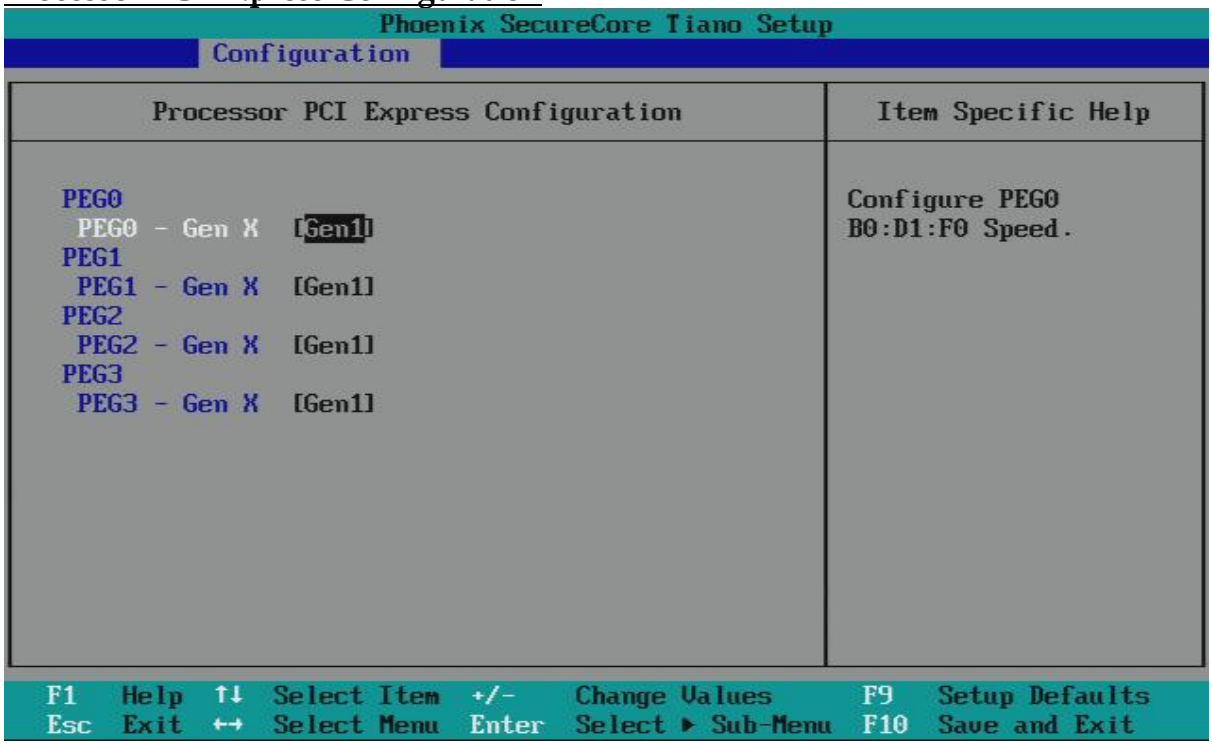
Configure PCI/PCI Express slot.


Phoenix SecureCore Tiano Setup
Configuration
PCI/PCIE Configuration
PCI Device Setting
SERR# Generation [Disabled]
PCI Express Setting
Processor PCI Express Configuration
PCH PCI Express Configuration
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

SERR# Generation

Choices: Enabled, Disabled.

Processor PCI Express Configuration


Phoenix SecureCore Tiano Setup
Configuration
Processor PCI Express Configuration
Item Specific Help
PEG0
PEG0 - Gen X [Gen1]
PEG1
PEG1 - Gen X [Gen1]
PEG2
PEG2 - Gen X [Gen1]
PEG3
PEG3 - Gen X [Gen1]
Configure PEG0
B0:D1:F0 Speed.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

PEG0 – Gen X
Configure PEG0 B0:D1:F0 Speed.

Choices: Auto, Gen1, Gen2, Gen3.

PEG1 – Gen X
Configure PEG1 B0:D1:F1 Speed.

Choices: Auto, Gen1, Gen2, Gen3.

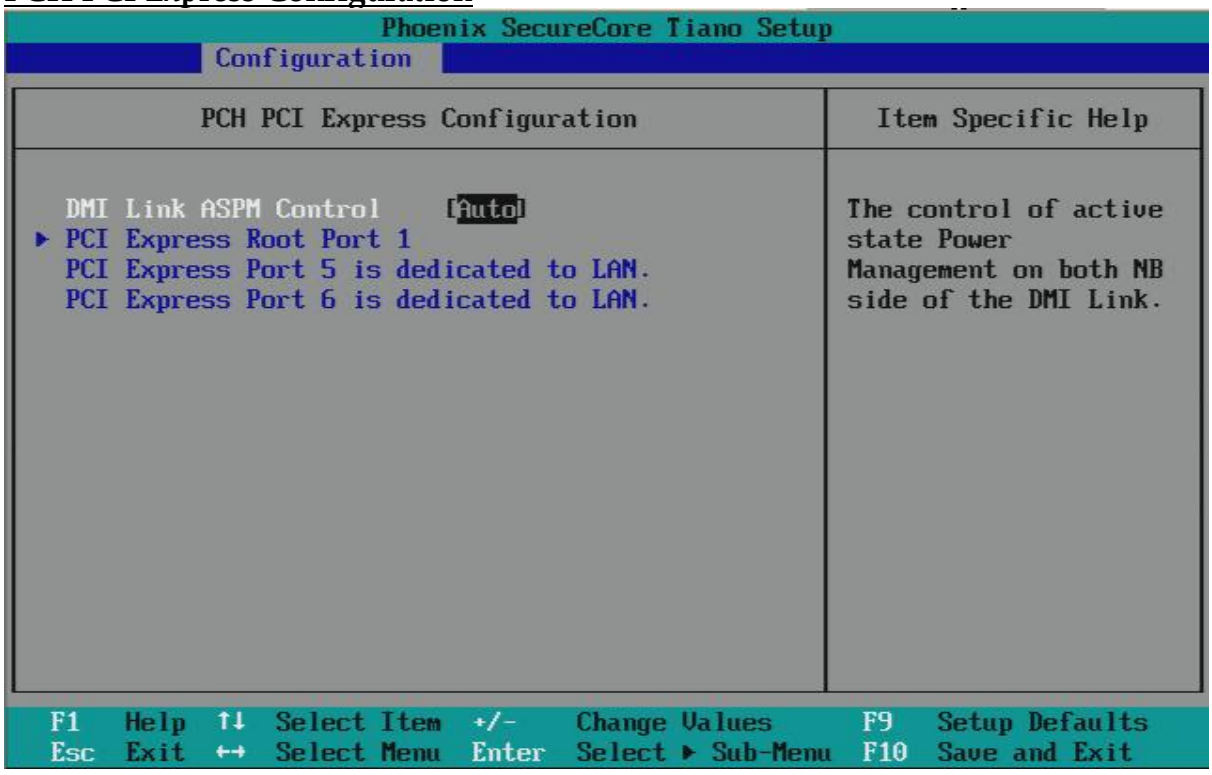
PEG2 – Gen X
Configure PEG2 B0:D1:F2 Speed.

Choices: Auto, Gen1, Gen2, Gen3.

PEG3 – Gen X
Configure PEG3 B0:D6:F0 Speed.

Choices: Auto, Gen1, Gen2, Gen3.

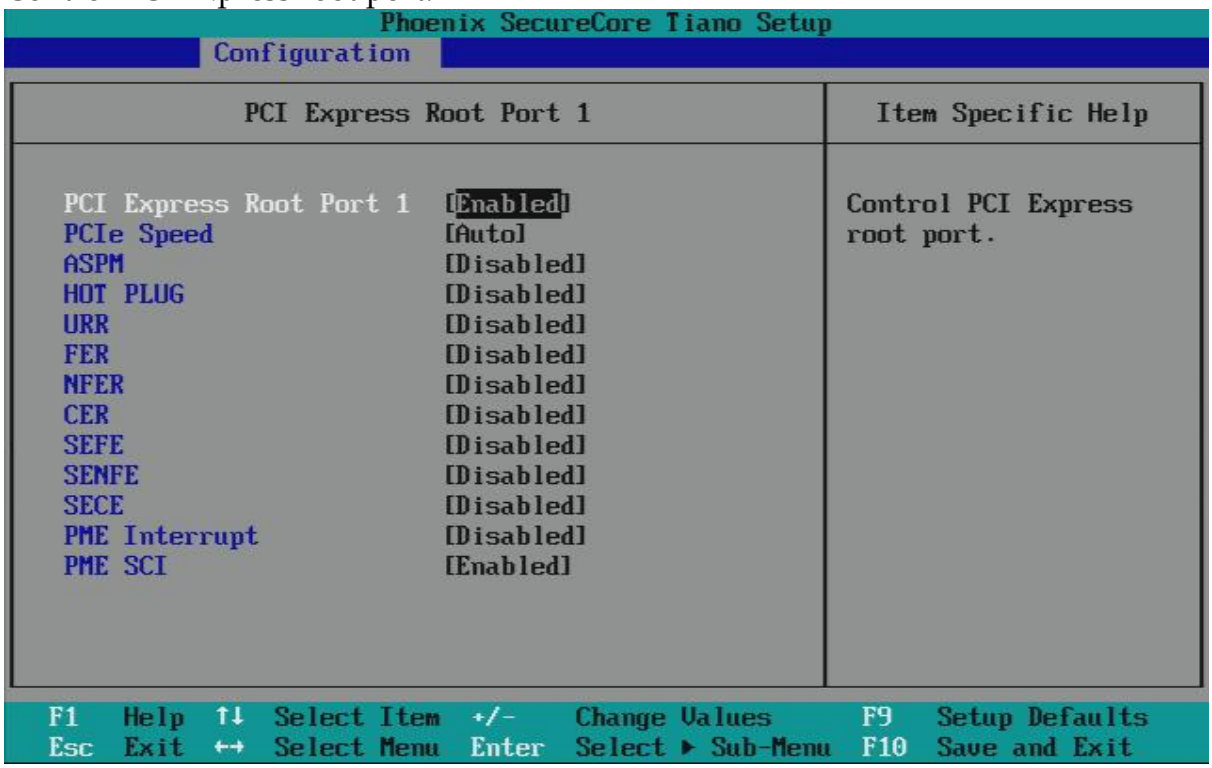
PCH PCI Express Configuration


Phoenix SecureCore Tiano Setup
Configuration
PCH PCI Express Configuration
Item Specific Help
DMI Link ASPM Control [Auto]
PCI Express Root Port 1
PCI Express Port 5 is dedicated to LAN.
PCI Express Port 6 is dedicated to LAN.
The control of active state Power Management on both NB side of the DMI Link.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

DMI Link ASPM Control
The control of active state Power Management on both NB side of the DMI Link.

Choices: Disabled, L0s, L0sL1, Auto.

PCI Express Root Port 1
Control PCI Express root port.



PCI Express Root Port 1
Control PCI Express root port.

Choices: Disabled, Enabled.

PCIe Speed
Select PCIe Speed to Gen1 or Gen2

Choices: Auto, Gen1, Gen2.

ASPM
Control PCIe Active State Power Management settings.

Choices: Disabled, L0S, L1, L0S And L1, Auto.

Hot PLUG
PCI Express Hot Plug Enabled/Disabled.

Choices: Disabled, Enabled.

URR
PCI Express Unsupported Request Reporting Enable/Disable.

Choices: Disabled, Enabled.

FER
PCI Express Device Non-Fatal Error Reporting Enable/Disable.

Choices: Disabled, Enabled.

CER
PCI Express Device Correctable Error Reporting Enable/Disable.

Choices: Disabled, Enabled.

SEFE
Root PCI Express Device System Error on Fatal Error Enable/Disable.

Choices: Disabled, Enabled.

SENFE
Root PCI Express Device System Error on Non-Fatal Error Enable/Disable.

Choices: Disabled, Enabled.

SECE
Root PCI Express Device System Error on Correctable Error Enable/Disable.

Choices: Disabled, Enabled.

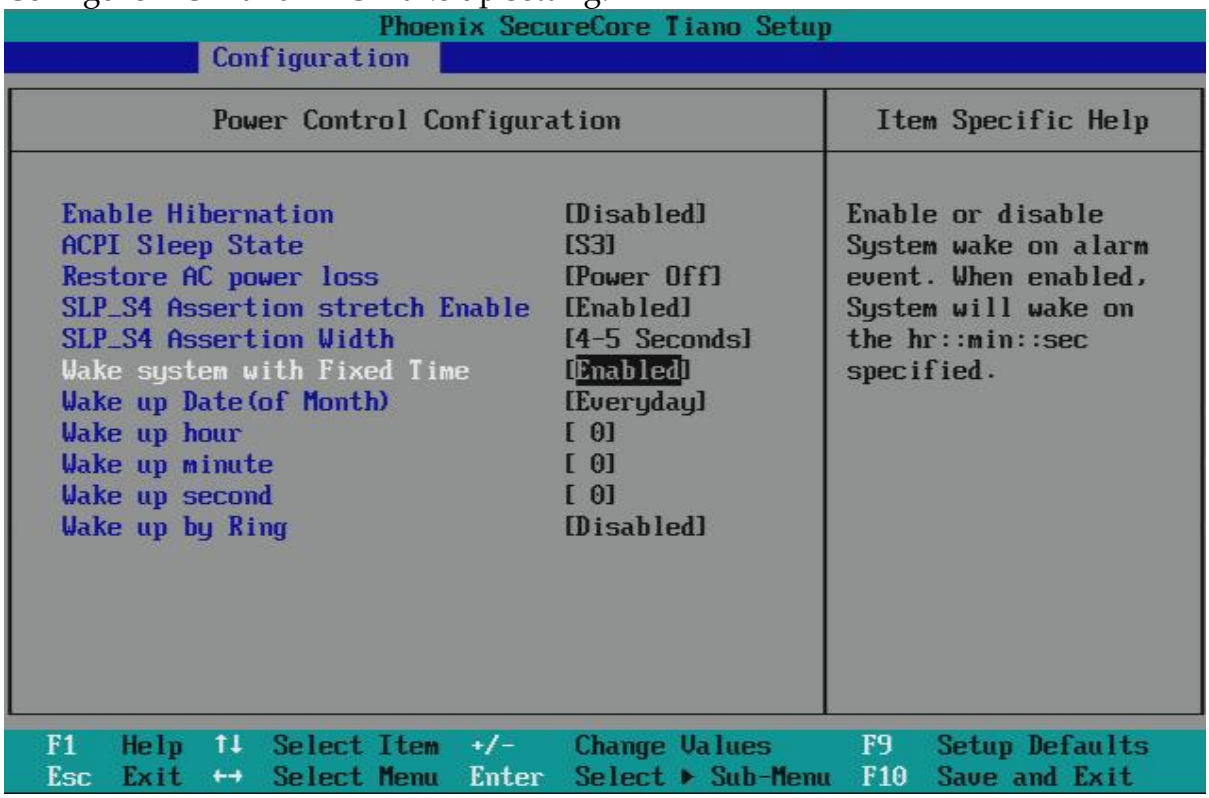
PME Interrupt
Root PCI Express PME Interrupt Enable/Disable.

Choices: Disabled, Enabled.

PME SCI
PCI Express PME SCI Enable/Disable.

Choices: Disabled, Enabled.

Power Control Configuration
Configure ACPI and RTC wake up setting.


Phoenix SecureCore Tiano Setup
Configuration
Power Control Configuration
Item Specific Help
Enable Hibernation [Disabled]
ACPI Sleep State [S3]
Restore AC power loss [Power Off]
SLP_S4 Assertion stretch Enable [Enabled]
SLP_S4 Assertion Width [4-5 Seconds]
Wake system with Fixed Time [Enabled]
Wake up Date(of Month) [Everyday]
Wake up hour [0]
Wake up minute [0]
Wake up second [0]
Wake up by Ring [Disabled]
Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Enable Hibernation
Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

Choices: Enabled, Disabled.

ACPI Sleep State
Select the highest ACPI Sleep state the system will enter when the SUSPEND button is pressed.

Choices: S1, S3.

Restore AC Power Loss
Select AC Power state when power is re-applied after a power failure.
Choices: Power Off, Power On, Last State.

SLP_S4 Assertion Stretch Enable
Choices: Enabled, Disabled.

SLP_S4 Assertion Stretch Width
Choices: 1-2 Seconds, 2-3 Seconds, 3-4 Seconds, 4-5 Seconds.

Wake system with Fixed Time
Enable or Disable system wake on alarm event. When Enabled, system will wake on the hr::min::sec specified.

Choices: Disabled, Enabled

Wake up Date(of Month)
If resume by alarm set to enable, select the desired time to wake up system.

Choices: Every day, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31.

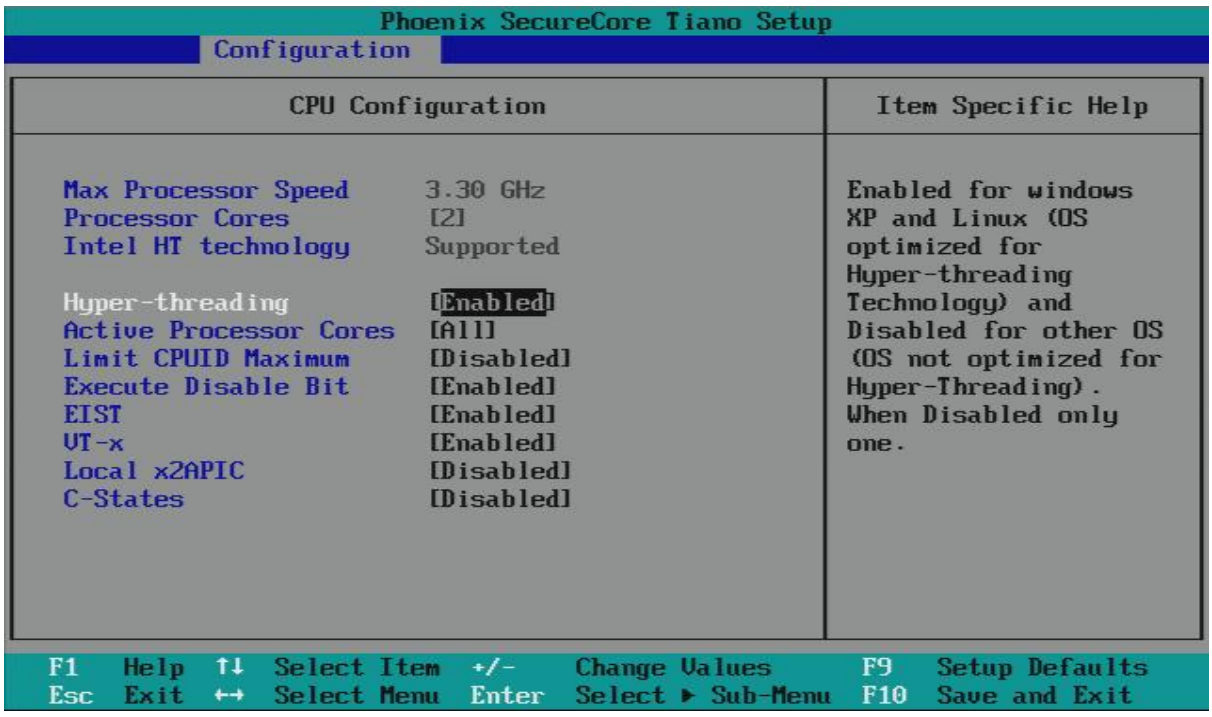
Wake up hour
Choices: 0-23

Wake up minute
Choices: 0-59

Wake up second
Choices: 0-59

Wake up by Ring
Choices: Enabled, Disabled.

CPU configuration
Configure the specific active core(s) and advanced processor management technologies.


Phoenix SecureCore Tiano Setup
Configuration
CPU Configuration
Item Specific Help
Max Processor Speed 3.30 GHz
Processor Cores [2]
Intel HT technology Supported
Hyper-threading [Enabled]
Active Processor Cores [All]
Limit CPUID Maximum [Disabled]
Execute Disable Bit [Enabled]
EIST [Enabled]
VT-x [Enabled]
Local x2APIC [Disabled]
C-States [Disabled]
Enabled for windows XP and Linux (OS optimized for Hyper-threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading). When Disabled only one.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Hyper-Threading
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.

Choices: Disabled, Enabled.

Active Processor Cores
Select the number of physical cores to enable in each processor package.

Choices: All, 1.

Limit CPUID Maximum
Disabled for Windows XP.

Choices: Disabled, Enabled.

Execute Disabled Bit
Enabled Execute Disabled functionality. Also known as Data Execution Prevention (DEP).

Choices: Disabled, Enabled.

EIST
Choices: Disabled, Enabled.

VT-x
When enabled, a VWM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Choices: Disabled, Enabled.

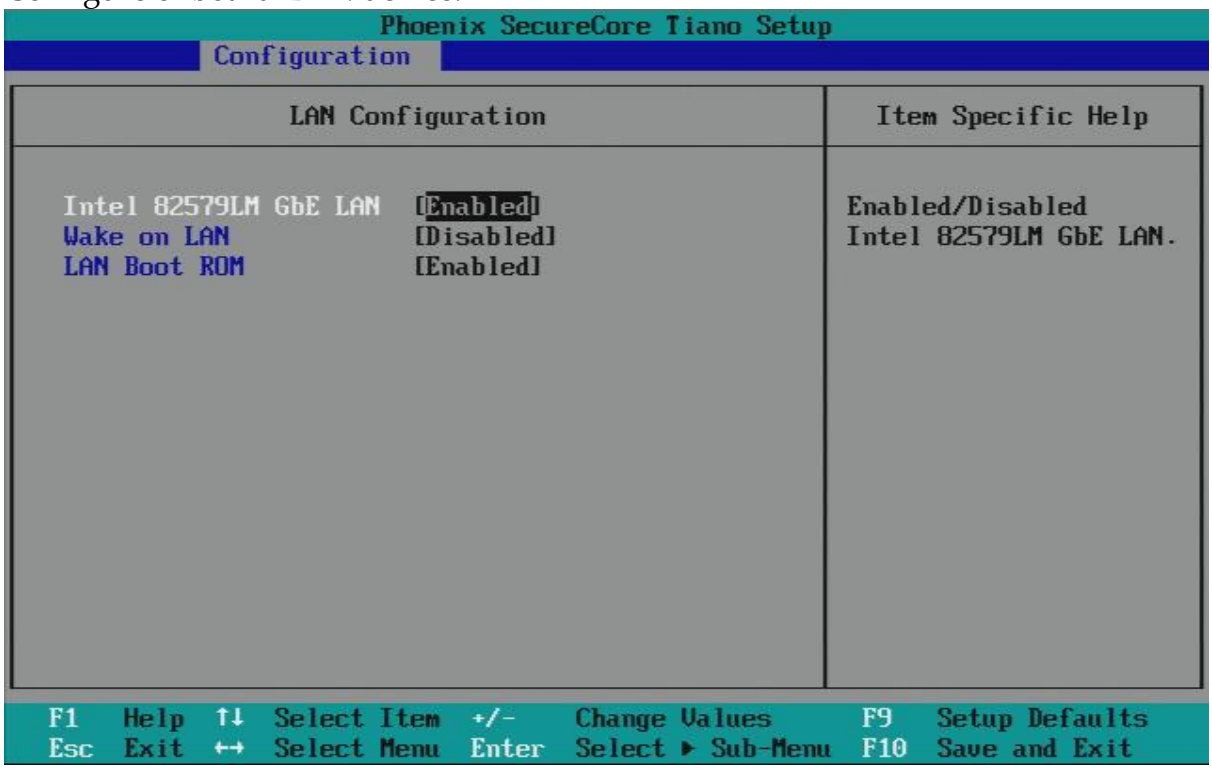
Local x2APIC
Choices: Disabled, Enabled.

C-States
Enable processor idle power saving states (C-States).

Choices: Disabled, Enabled.

LAN Configuration

Configure onboard LAN device.


Phoenix SecureCore Tiano Setup
Configuration
LAN Configuration
Item Specific Help
Intel 82579LM GbE LAN [Enabled]
Wake on LAN [Disabled]
LAN Boot ROM [Enabled]
Enabled/Disabled Intel 82579LM GbE LAN.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

Intel 82579LM GbE LAN

Enabled/Disabled Intel 82579LM GbE LAN.

Choices: Disabled, Enabled.

Wake on LAN

Enabled/Disabled Wake on LAN Function.

Choices: Disabled, Enabled.

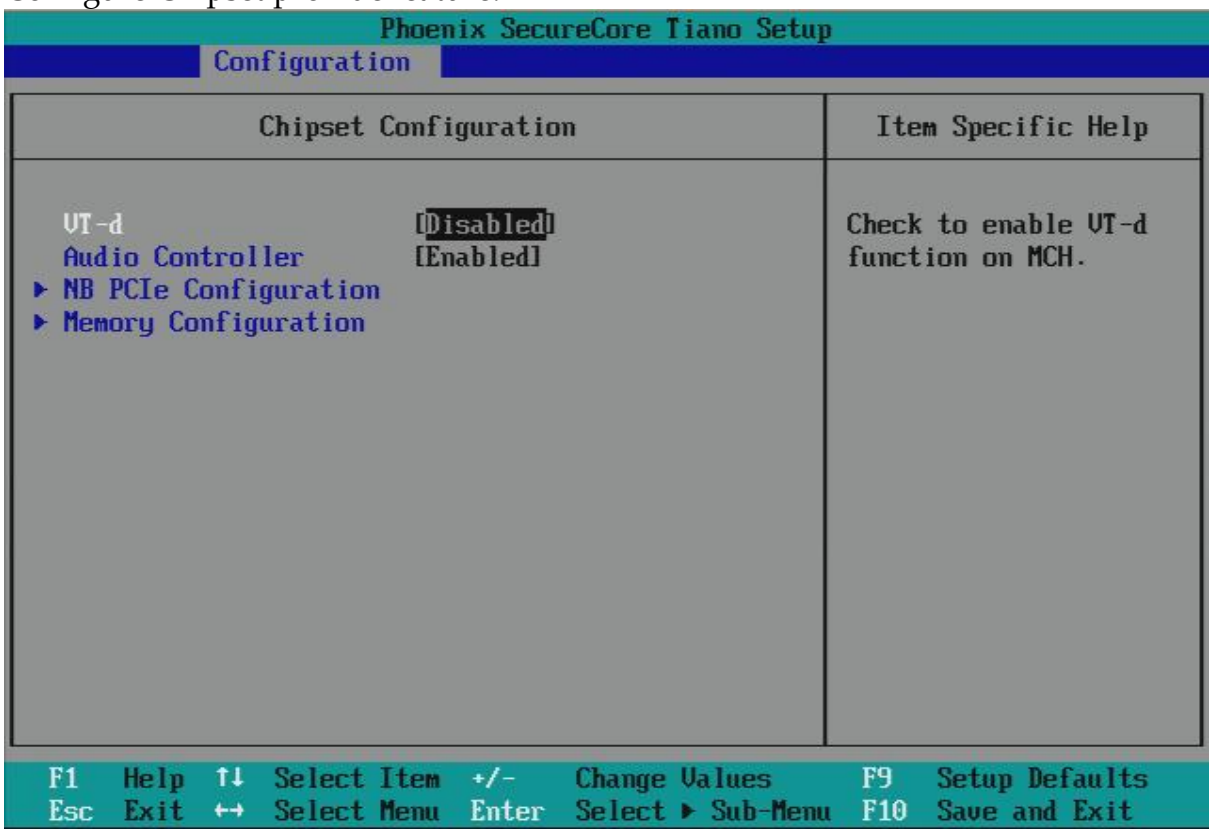
LAN Boot ROM

Control LAN Boot ROM (PXE) function.

Choices: Disabled, Enabled.

Chipset Configuration

Configure Chipset provide feature.


Phoenix SecureCore Tiano Setup
Configuration
Chipset Configuration
Item Specific Help
VT-d [Disabled]
Audio Controller [Enabled]
NB PCIe Configuration
Memory Configuration
Check to enable VT-d function on MCH.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

VT-d

Check to enable VT-d function on MCH.

Choices: Disabled, Enabled.

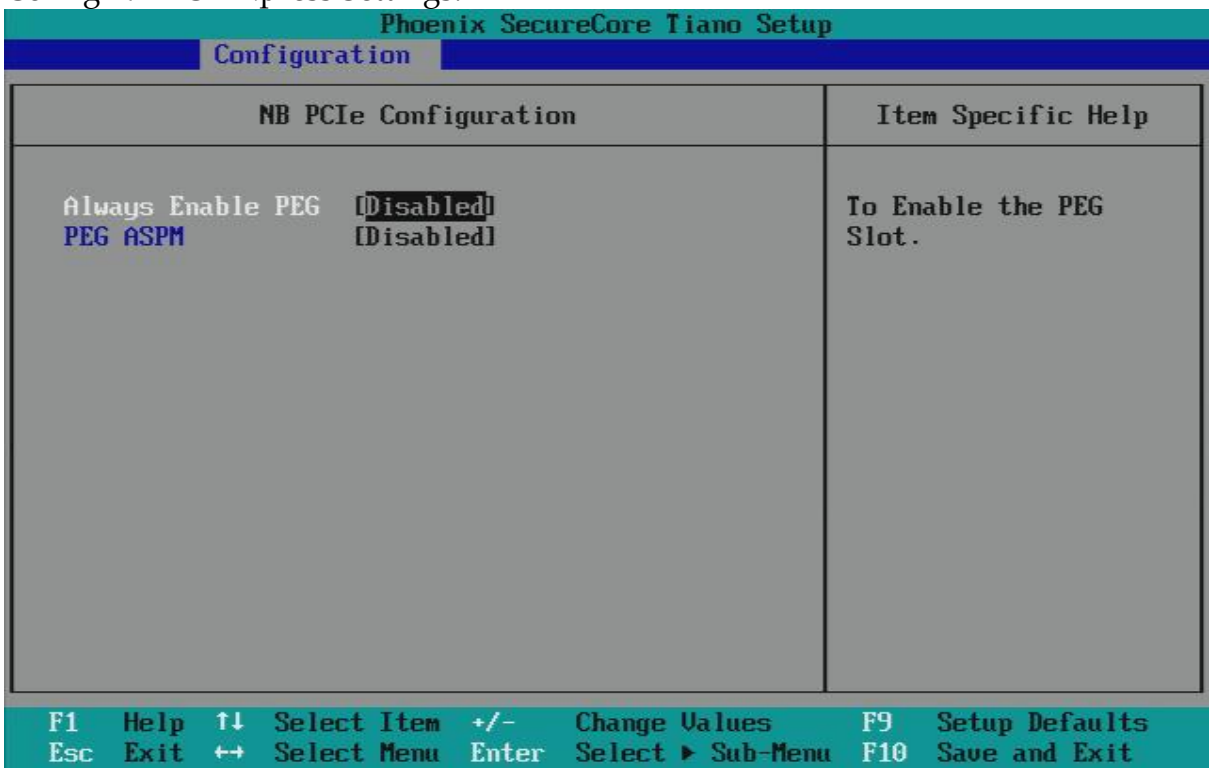
Audio Controller

Control Detection of the Azalia device.

Choices: Disabled, Enabled.

NB PCIe Configuration

Config NB PCI Express Settings.


Phoenix SecureCore Tiano Setup
Configuration
NB PCIe Configuration
Item Specific Help
Always Enable PEG [Disabled]
PEG ASPM [Disabled]
To Enable the PEG Slot.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

Always Enable PEG

To Enable the PEG Slot.

Choices: Disabled, Enabled.

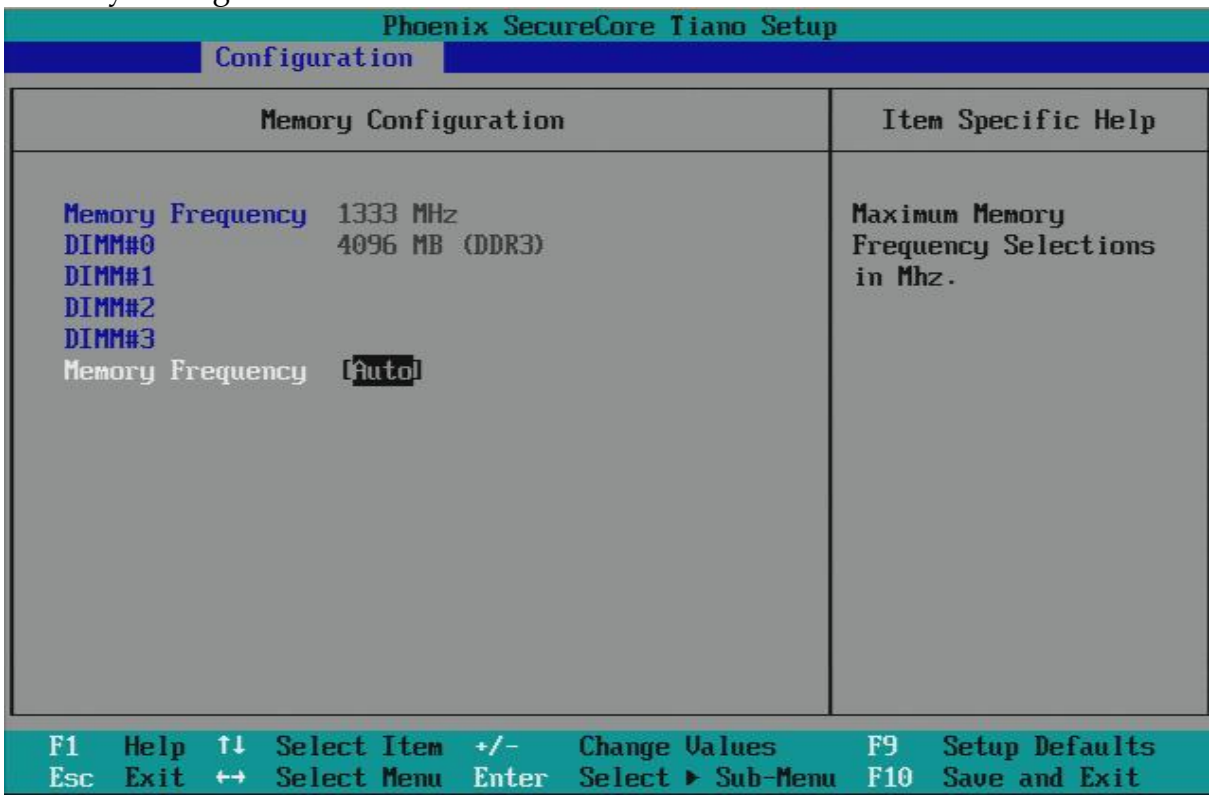
PEG ASPM

Control ASPM Support for the PEG Device. This has mp effect if PEF is not the current active device.

Choices: Disabled, Auto, ASPM L0s, ASPM L1, ASPM L0sL1.

Memory Configuration

Memory Configuration Parameters.


Phoenix SecureCore Tiano Setup
Configuration
Memory Configuration
Item Specific Help
Memory Frequency 1333 MHz
DIMM#0 4096 MB (DDR3)
DIMM#1
DIMM#2
DIMM#3
Memory Frequency [Auto]
Maximum Memory Frequency Selections in Mhz.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

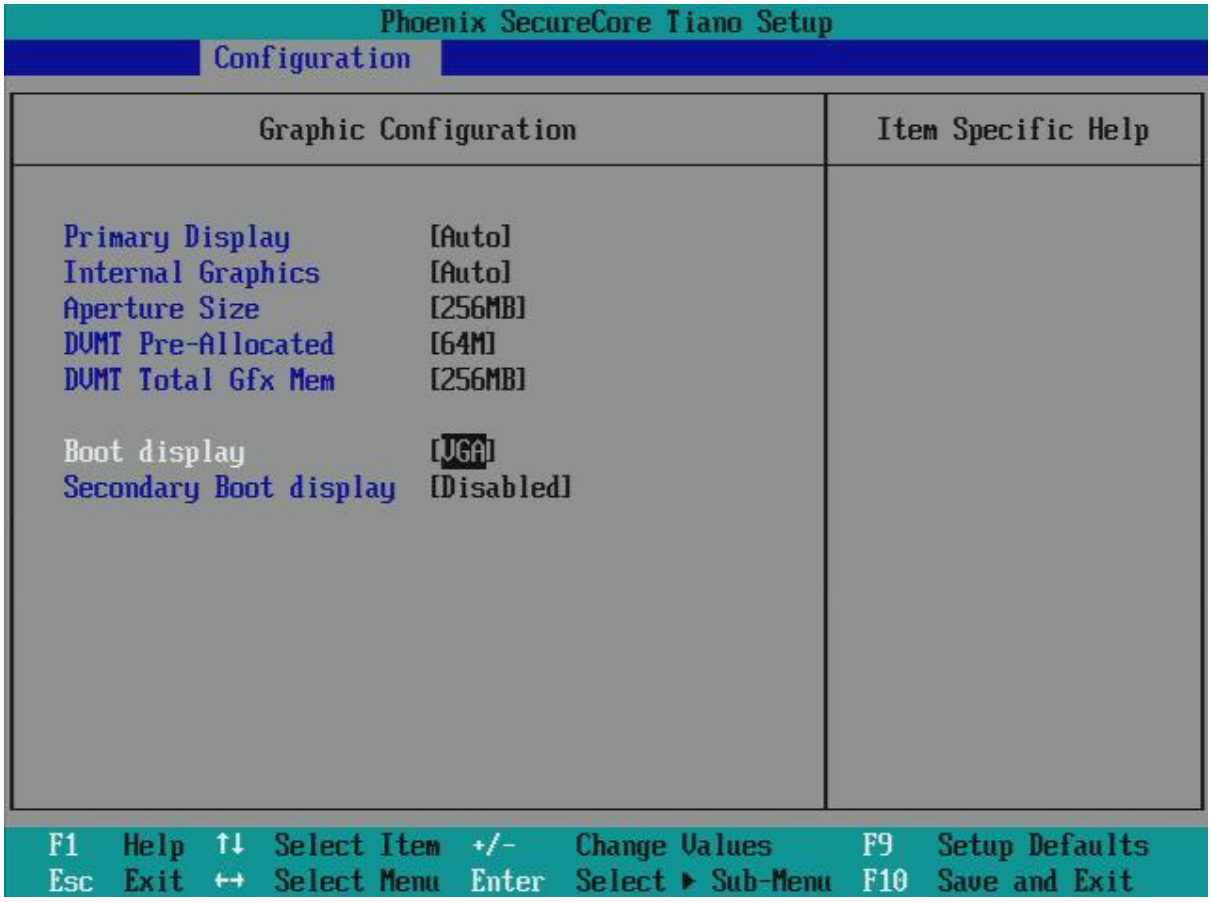
Memory Frequency

Maximum Memory Frequency Selections in Mhz.

Choices: Auto, 1067, 1333, 1600, 1867, 2133.

Graphic Configuration

Configure integrated Graphic like Boot display , video memory and external Graphic feature.


Phoenix SecureCore Tiano Setup
Configuration
Graphic Configuration
Item Specific Help
Primary Display [Auto]
Internal Graphics [Auto]
Aperture Size [256MB]
DVMT Pre-Allocated [64M]
DVMT Total Gfx Mem [256MB]
Boot display [VGA]
Secondary Boot display [Disabled]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Primary Display

Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.

Choices: Auto, IGFX, PEG, PCI.

Internal Graphics

Keep IGD Enabled based on the setup options

Choices: Auto, Disabled, Enabled.

Aperture Size

Select the Aperture Size.

Choices: 128MB, 256MB, 512MB.

DVMT Pre-Allocated
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the internal Graphic Device.

Choices: 0M, 32M, 64M, 96M, 128M, 160M, 192M, 224M, 256M, 288M, 320M, 352M, 384M, 416M, 448M, 480M, 512M.

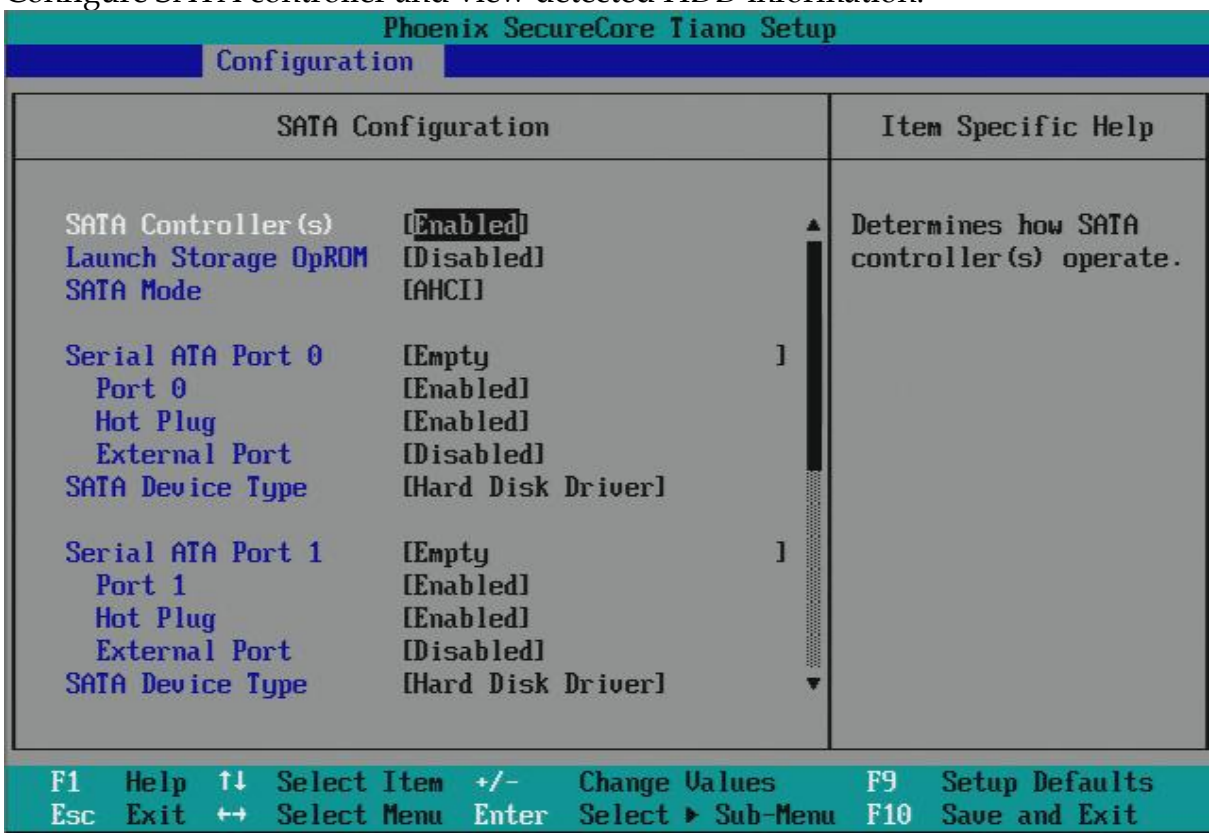
DVMT Total Gfx Mem
Select DVMT 5.0 Total Graphic Memory size used by the internal Graphic Device.

Choices: 128MB, 256MB, MAX.

Boot Display
Choices: VBIOS Default, VGA, DVI, HDMI.

Secondary Boot Display
Choices: Disabled, VGA, DVI, HDMI.

SATA Configuration
Configure SATA controller and view detected HDD information.


Phoenix SecureCore Tiano Setup
Configuration
SATA Configuration
Item Specific Help
SATA Controller(s) [Enabled]
Launch Storage OpROM [Disabled]
SATA Mode [AHCI]
Serial ATA Port 0 [Empty]
Port 0 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
SATA Device Type [Hard Disk Driver]
Serial ATA Port 1 [Empty]
Port 1 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
SATA Device Type [Hard Disk Driver]
Determines how SATA controller(s) operate.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

SATA Controller (s)
Determines how SATA controller (s) operate.

Choices: Disabled, Enabled.

Launch Storage OpROM
Enable or Disable Boot Option for Legacy Mass Storage Devices with Option ROM.

Choices: Enabled, Disabled.

SATA Mode
Determines how SATA controller (s) operate.

Choices: IDE, AHCI, RAID.

Serial ATA Port 0-3
Display the identity of the device attached.

Port 0-3
Enable or Disable SATA Port 0-3.

Choices: Enabled, Disabled.

Hot Plug
Designates this port as Hot Pluggable.

Choices: Enabled, Disabled.

External Port
External SATA Support.

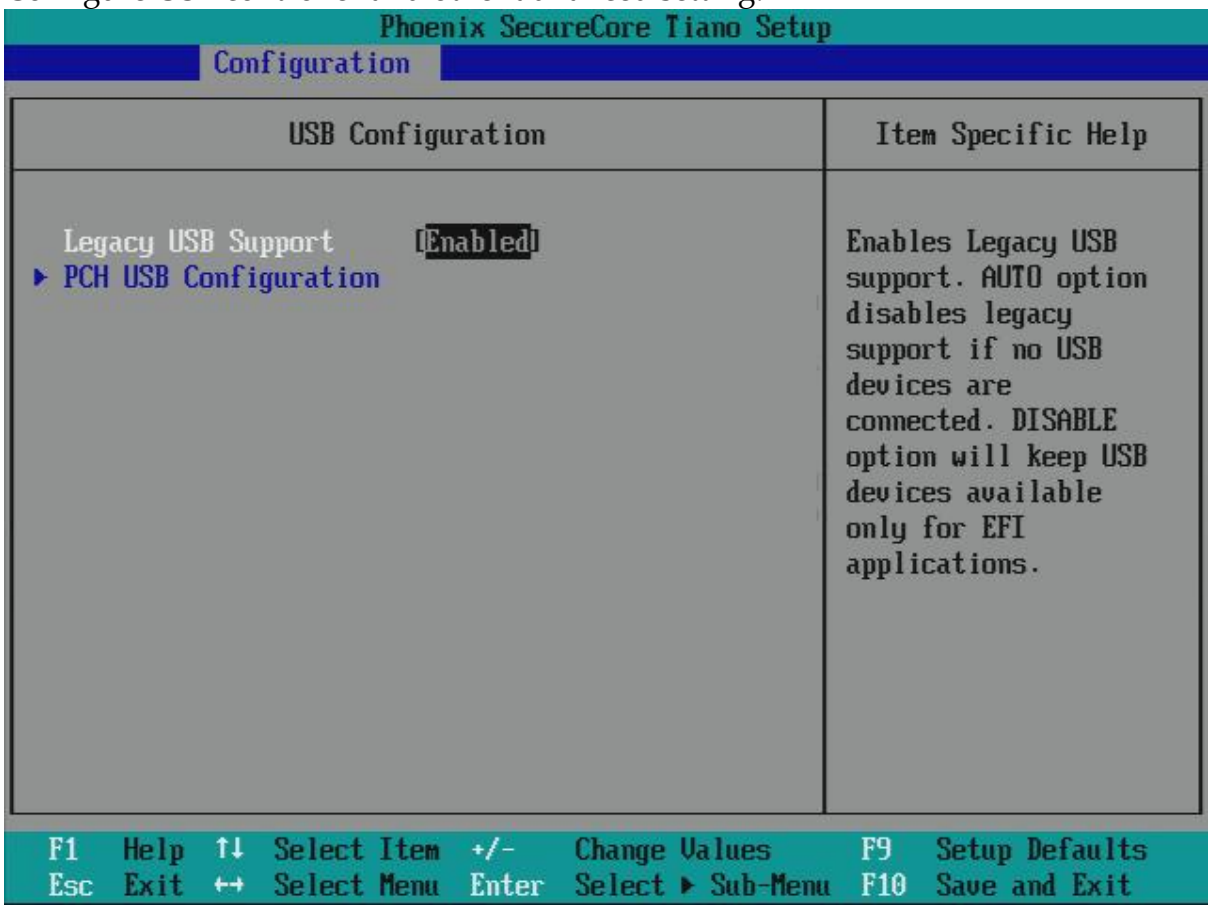
Choices: Enabled, Disabled.

SATA Device Type
Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

Choices: Hard Disk Driver, Solid State Driver.

USB Configuration

Configure USB controller and other advanced setting.


Phoenix SecureCore Tiano Setup
Configuration
USB Configuration
Item Specific Help
Legacy USB Support [Enabled]
PCH USB Configuration
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

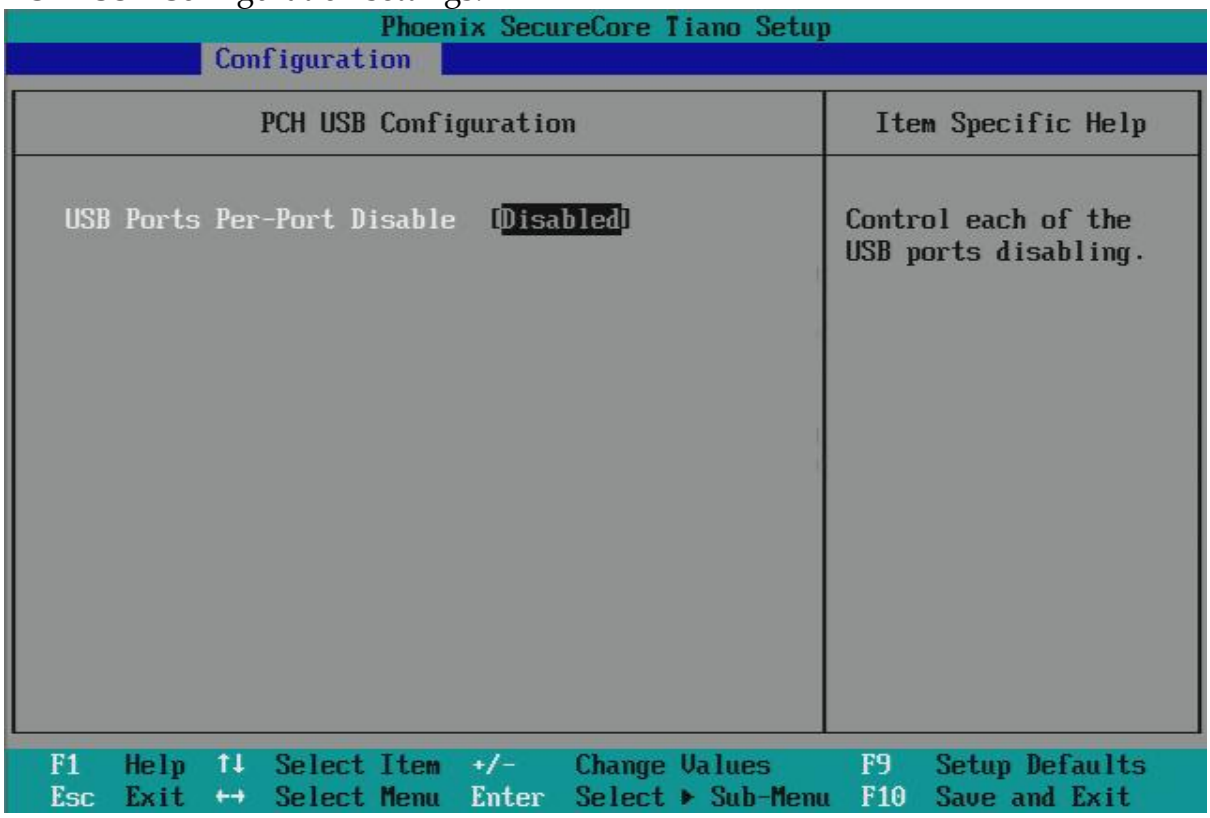
Legacy USB Support

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

Choices: Enabled, Disabled.

PCH USB Configuration

PCH USB Configuration settings.


Phoenix SecureCore Tiano Setup
Configuration
PCH USB Configuration
Item Specific Help
USB Ports Per-Port Disable [Disabled]
Control each of the USB ports disabling.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

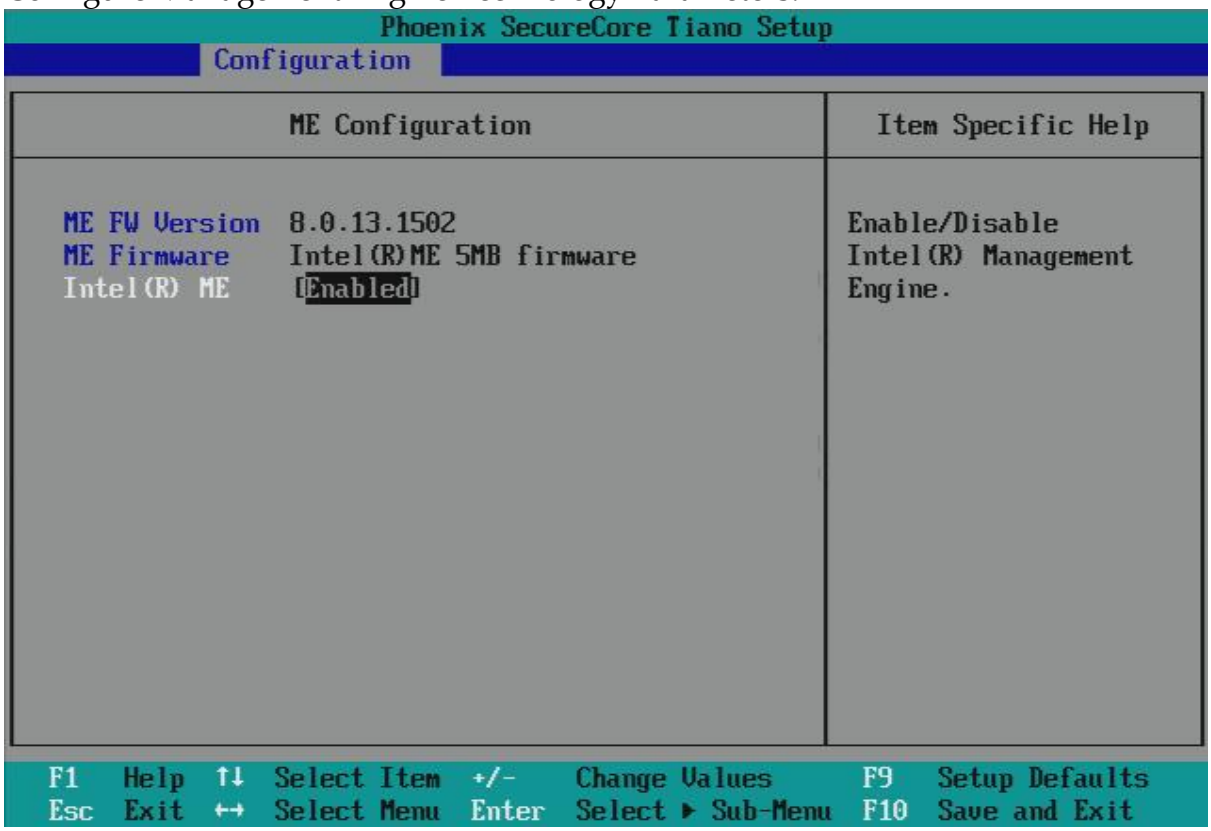
USB Ports Per-Port Disable

Control each of the USB ports disabling.

Choices: Enabled, Disabled.

ME Configuration

Configure Management Engine Technology Parameters.


Phoenix SecureCore Tiano Setup
Configuration
ME Configuration
Item Specific Help
ME FW Version 8.0.13.1502
ME Firmware Intel(R)ME 5MB firmware
Intel(R) ME [Enabled]
Enable/Disable Intel(R) Management Engine.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

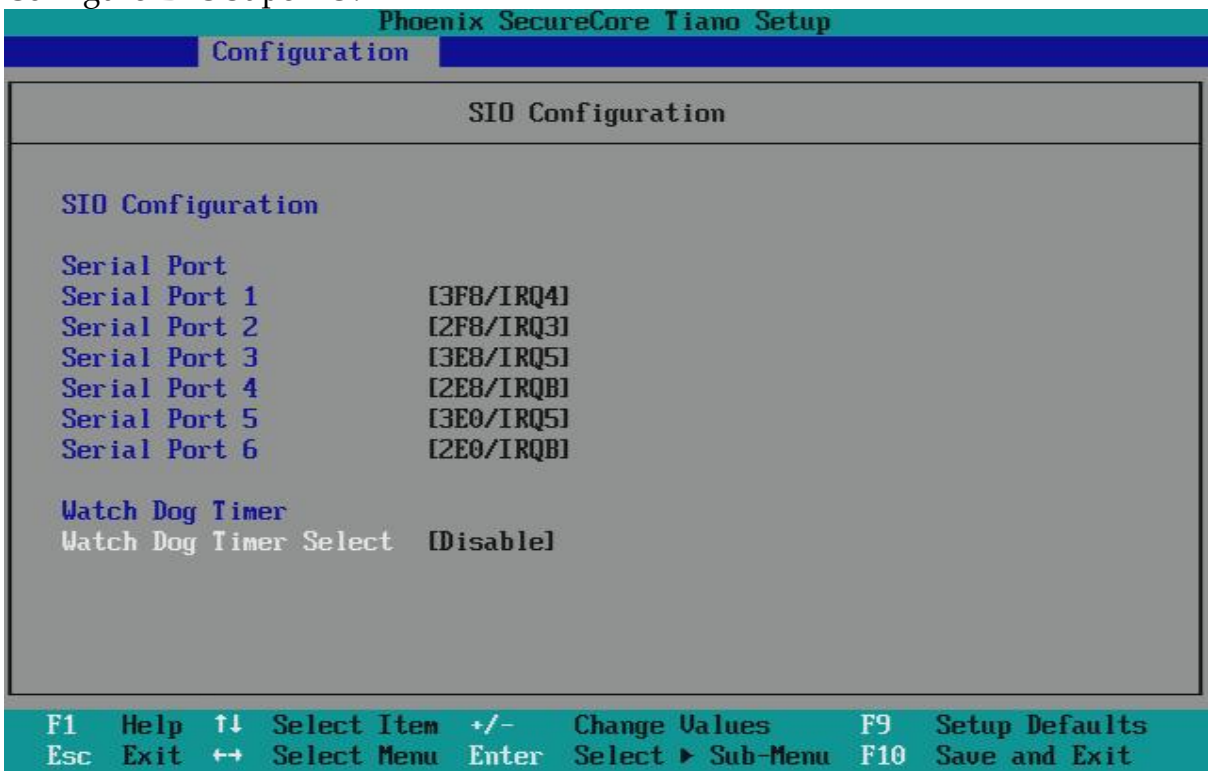
Intel (R) ME

Enable/Disable Intel (R) Management Engine.

Choices: Enabled, Disabled.

Super IO Configuration

Configure LPC Super IO.


Phoenix SecureCore Tiano Setup
Configuration
SIO Configuration
SIO Configuration
Serial Port
Serial Port 1 [3F8/IRQ4]
Serial Port 2 [2F8/IRQ3]
Serial Port 3 [3E8/IRQ5]
Serial Port 4 [2E8/IRQB]
Serial Port 5 [3E0/IRQ5]
Serial Port 6 [2E0/IRQB]
Watch Dog Timer
Watch Dog Timer Select [Disable]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Serial Port 1

Choices: Disabled, 3F8/IRQ4, 2F8/IRQ3.

Serial Port 2

Choices: Disabled, 3F8/IRQ4, 2F8/IRQ3.

Serial Port 3

Choices: Disabled, 3E8/IRQ5, 2E8/IRQB, 3E0/IRQ5, 2E0/IRQB.

Serial Port 4

Choices: Disabled, 3E8/IRQ5, 2E8/IRQB, 3E0/IRQ5, 2E0/IRQB.

Serial Port 5

Choices: Disabled, 3E8/IRQ5, 2E8/IRQB, 3E0/IRQ5, 2E0/IRQB.

Serial Port 6

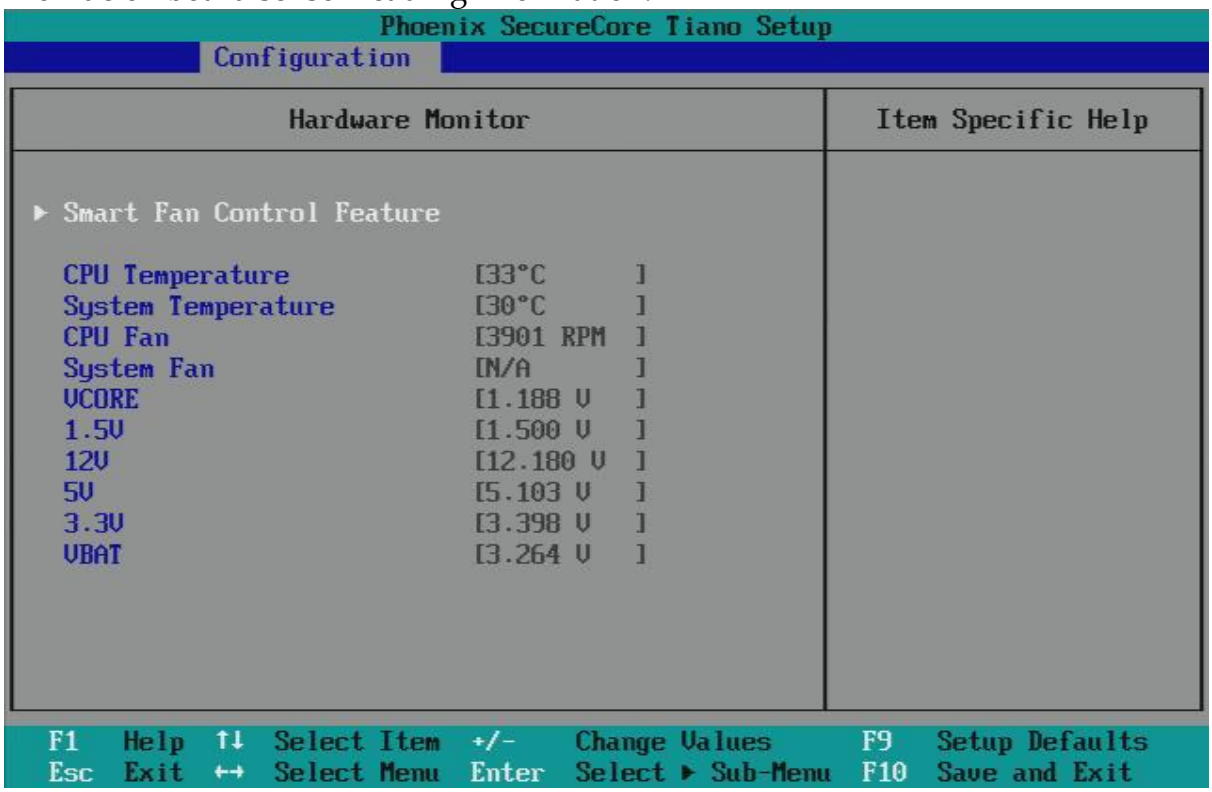
Choices: Disabled, 3E8/IRQ5, 2E8/IRQB, 3E0/IRQ5, 2E0/IRQB.

Watch Dog Timer Select

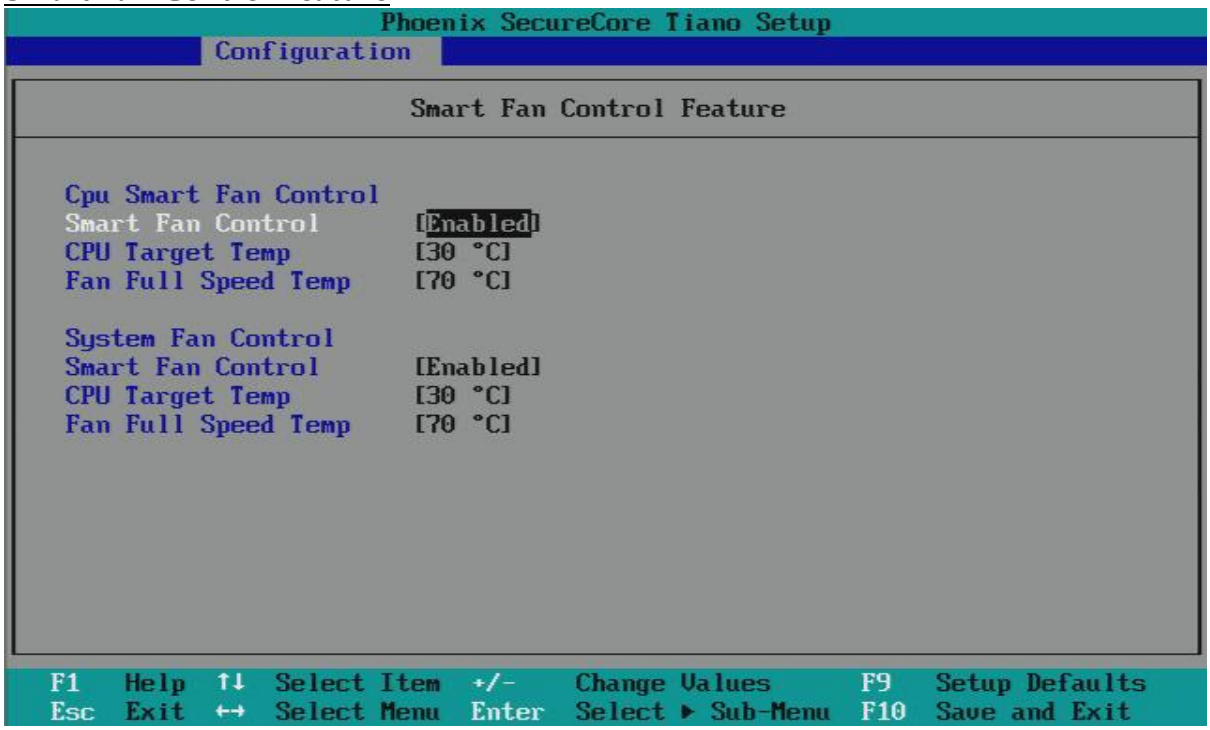
Choices: Disabled, 15 secs, 30 secs, 1 min, 2 mins, 3 mins.

Hardware Monitor

Provide on board sensor reading information.


Phoenix SecureCore Tiano Setup
Configuration
Hardware Monitor
Item Specific Help
Smart Fan Control Feature
CPU Temperature [33°C]
System Temperature [30°C]
CPU Fan [3901 RPM]
System Fan [N/A]
VCORE [1.188 V]
1.5V [1.500 V]
12V [12.180 V]
5V [5.103 V]
3.3V [3.398 V]
VBAT [3.264 V]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Smart Fan Control Feature


Phoenix SecureCore Tiano Setup
Configuration
Smart Fan Control Feature
Cpu Smart Fan Control
Smart Fan Control [Enabled]
CPU Target Temp [30 °C]
Fan Full Speed Temp [70 °C]
System Fan Control
Smart Fan Control [Enabled]
CPU Target Temp [30 °C]
Fan Full Speed Temp [70 °C]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Smart Fan Control
Choices: Enabled, Disabled.

CPU Target Temp
Choices: 25℃, 30℃, 35℃, 40℃, 45℃, 50℃, 55℃, 60℃, 65℃, 70℃, 75℃, 80℃, 85℃.

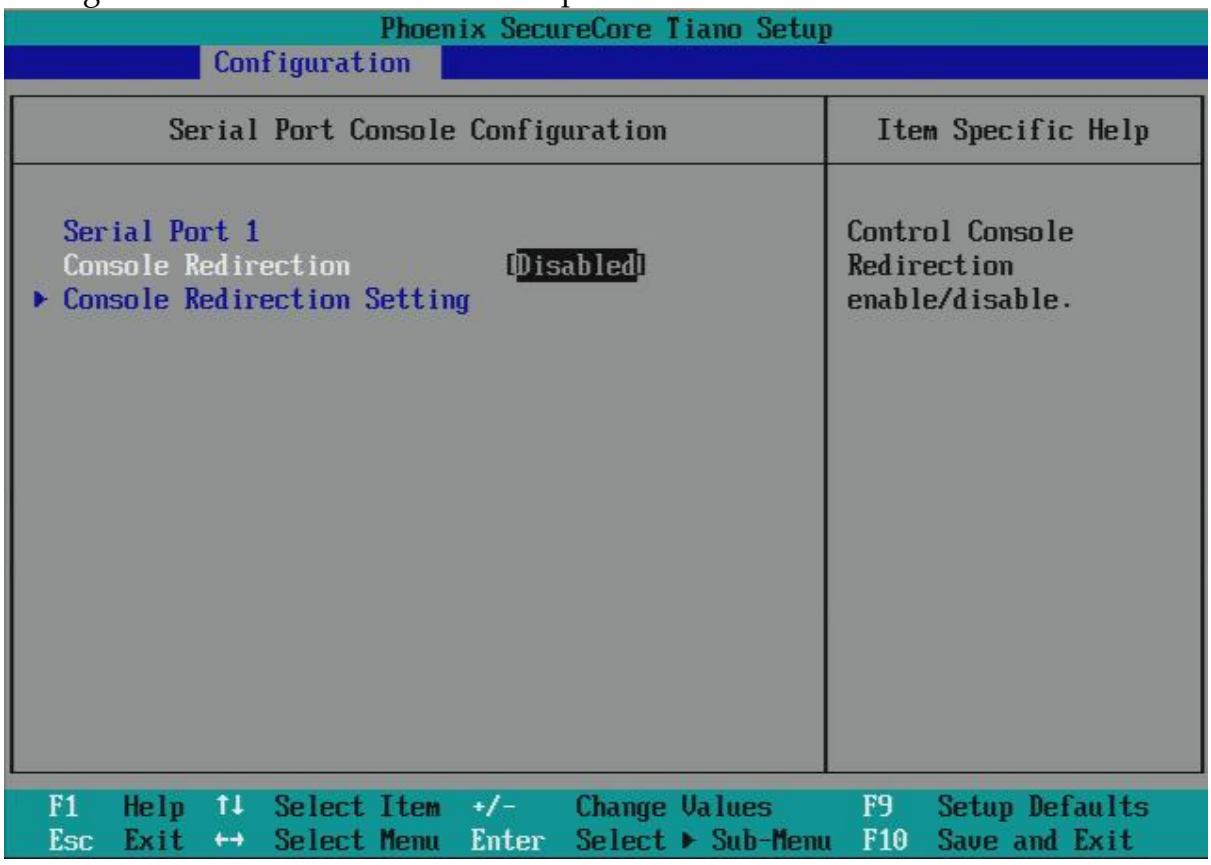
Fan Full Speed Temp
Choices: 50℃, 55℃, 60℃, 65℃, 70℃, 75℃, 80℃, 85℃.

Smart Fan Control
Choices: Enabled, Disabled

CPU Target Temp
Choices: 25℃, 30℃, 35℃, 40℃, 45℃, 50℃, 55℃, 60℃, 65℃, 70℃, 75℃, 80℃, 85℃.

Fan Full Speed Temp
Choices: 50℃, 55℃, 60℃, 65℃, 70℃, 75℃, 80℃, 85℃.

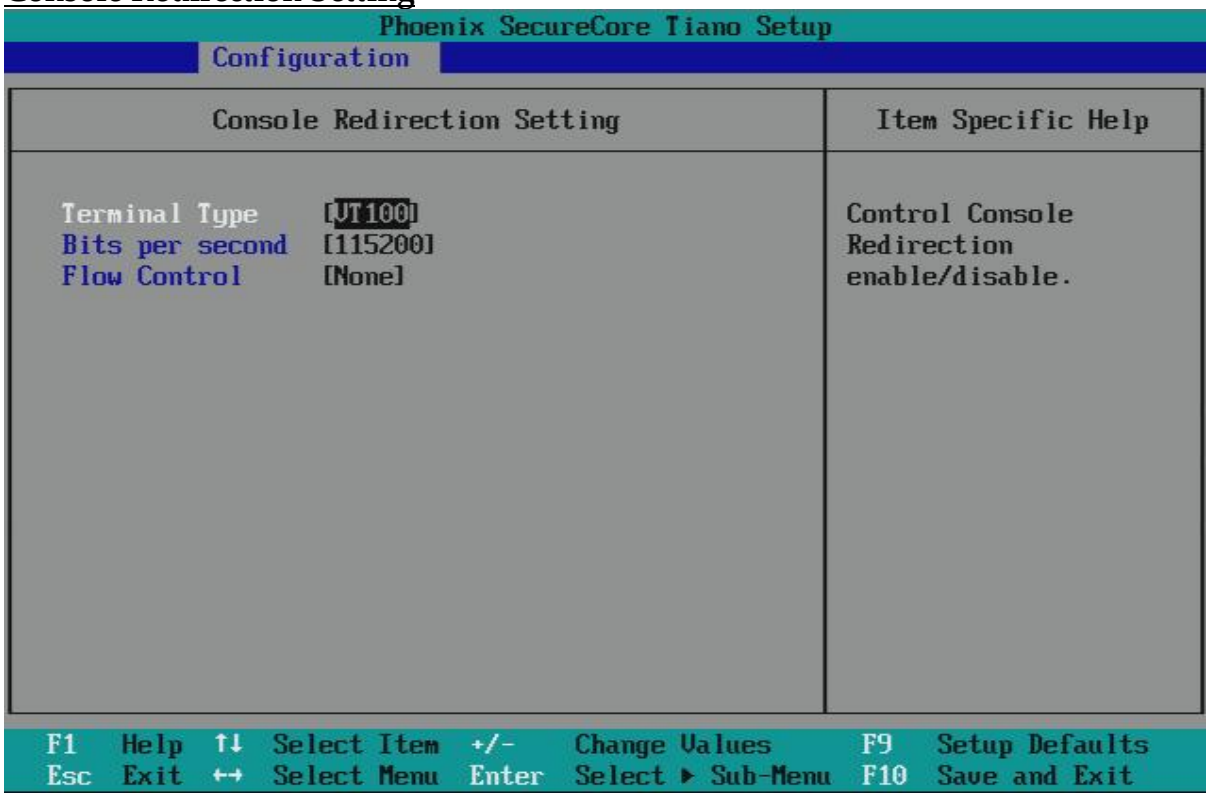
Serial Port Console Configuration
Configure console redirection on serial port.


Phoenix SecureCore Tiano Setup
Configuration
Serial Port Console Configuration
Item Specific Help
Serial Port 1
Console Redirection
[Disabled]
Console Redirection Setting
Control Console Redirection enable/disable.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Console Redirection
Control Console Redirection enable/disable.

Choices: Enabled, Disabled

Console Redirection Setting


Phoenix SecureCore Tiano Setup
Configuration
Console Redirection Setting
Item Specific Help
Terminal Type [VT100]
Bits per second [115200]
Flow Control [None]
Control Console Redirection enable/disable.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Terminal Type
Control Console Redirection enable/disable.

Choices: VT100, VT100+, VT-UTF8, ANSI.

Bits per second
Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

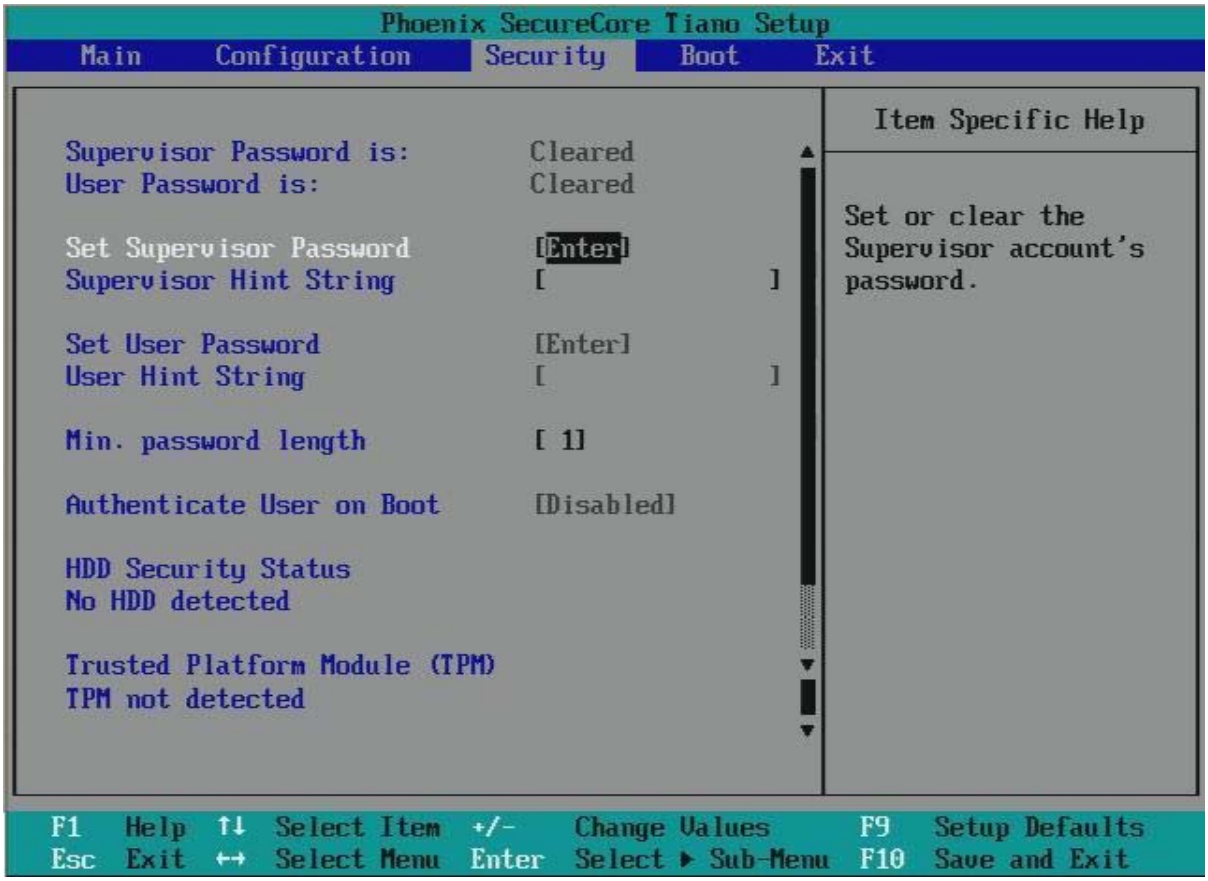
Choices: 9600, 19200, 57600, 115200.

Flow Control
Set flow control method for UCR.
None – No flow control.
RTS/CTS – Hardware flow control.
XON/XOFF – Software flow control.

Choices: None, Hardware RTS/CTS, Software Xon/Xoff.

4.4 Security

This section lets you set security passwords to control access to the system at boot time and/or when entering the BIOS setup program.


Phoenix SecureCore Tiano Setup
Main
Configuration
Security
Boot
Exit
Item Specific Help
Supervisor Password is: Cleared
User Password is: Cleared
Set Supervisor Password [Enter]
Supervisor Hint String [ ]
Set User Password [Enter]
User Hint String [ ]
Min. password length [1]
Authenticate User on Boot [Disabled]
HDD Security Status
No HDD detected
Trusted Platform Module (TPM)
TPM not detected
Set or clear the Supervisor account's password.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Set Supervisor Password
Set or clear the Supervisor account' password.

Supervisor Hint String
Press Enter to type Supervisor Hint String.

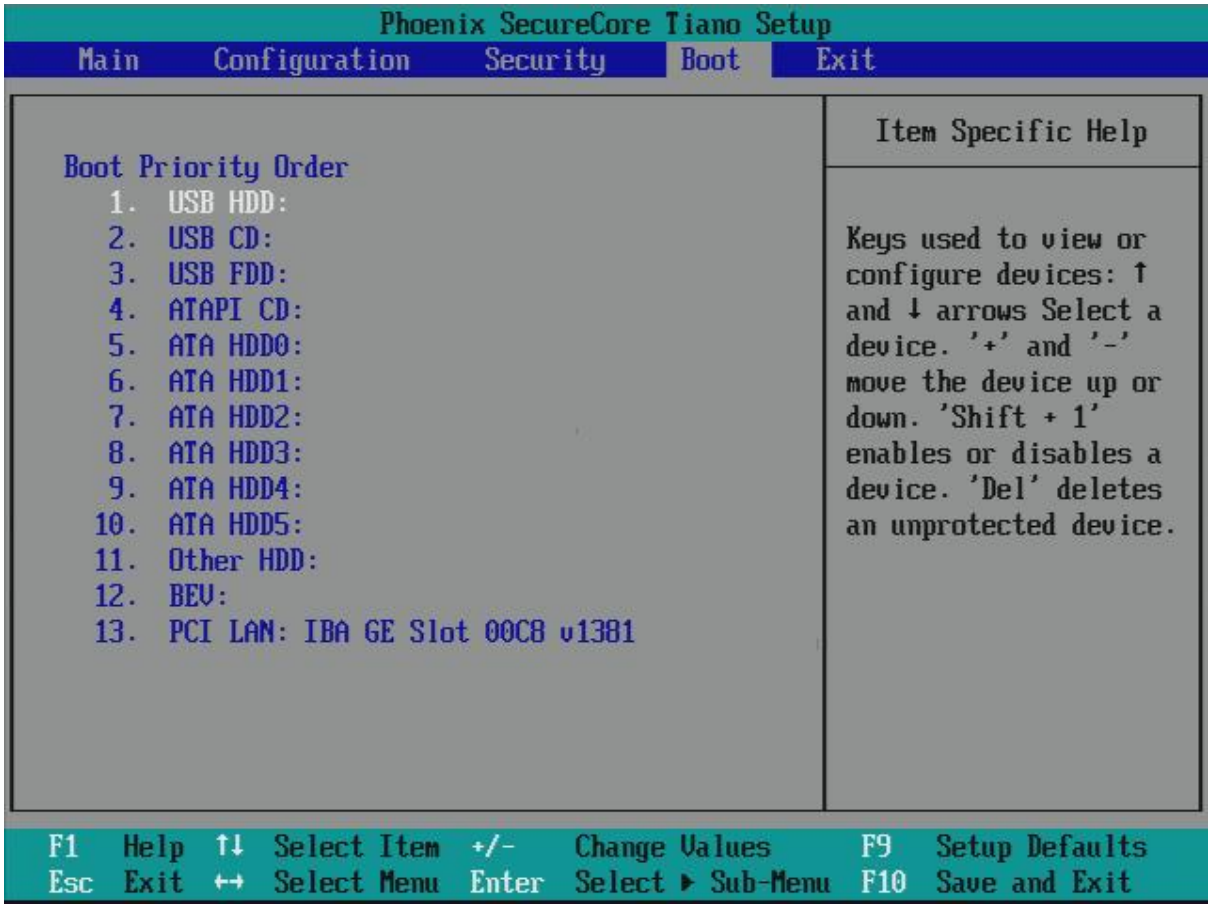
Set User Password
Set or clear the User account' password.

Supervisor Hint String
Press Enter to type User Hint String.

Min. password length
Set the minimum number of characters for password (1-20).

4.5 Boot

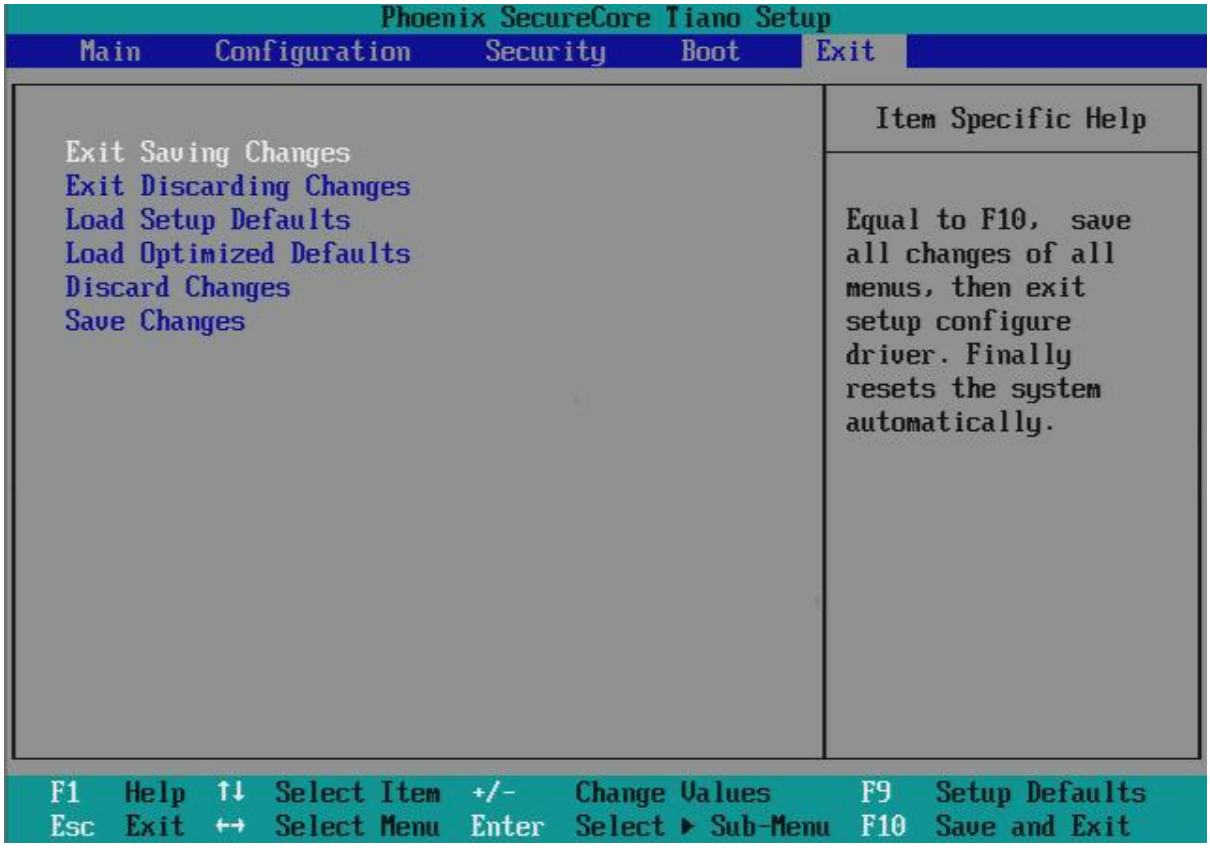
Use this menu to specify the priority of boot devices.


Phoenix SecureCore Tiano Setup
Main
Configuration
Security
Boot
Exit
Item Specific Help
Boot Priority Order
1. USB HDD:
2. USB CD:
3. USB FDD:
4. ATAPI CD:
5. ATA HDD0:
6. ATA HDD1:
7. ATA HDD2:
8. ATA HDD3:
9. ATA HDD4:
10. ATA HDD5:
11. Other HDD:
12. BEV:
13. PCI LAN: IBA GE Slot 00C8 v1381
Keys used to view or configure devices: ↑ and ↓ arrows Select a device. '+' and '-' move the device up or down. 'Shift + 1' enables or disables a device. 'Del' deletes an unprotected device.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Boot Priority Order

Keys used to view or configure devices: ↑ and ↓ arrows Select a device. '+' and '-'move the device up or down. 'Shift + 1' enabled or disables a device. 'Del' deletes an unprotected device.

4.6 Exit


Phoenix SecureCore Tiano Setup
Main
Configuration
Security
Boot
Exit
Exit Saving Changes
Exit Discarding Changes
Load Setup Defaults
Load Optimized Defaults
Discard Changes
Save Changes
Item Specific Help
Equal to F10, save all changes of all menus, then exit setup configure driver. Finally resets the system automatically.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Exit Saving Changes
Equal to F10, save all changes of all menus, then exit setup configure driver. Finally resets the system automatically.

Exit Discarding Changes
Equal to ESC, never save changes, then exit setup configure driver.

Load Setup Defaults
Equal to F9. Load standard default values.

Load Optimized Defaults
Load settings for optimized boot time and system performance.

Discard Changes
Load the original value of this boot time. Not the default Setup value.

Save Changes
Save all changes of all menus, but do not reset system.

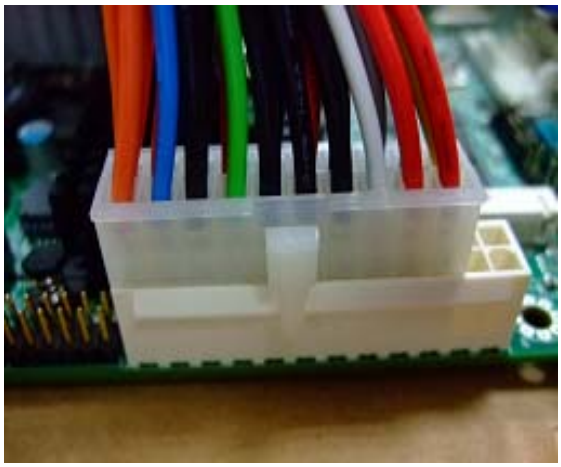
Chapter 5
Troubleshooting

This chapter provides a few useful tips to quickly get WADE-8013/WADE-8014 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

ATX Power Setting

Unlike other Single board computer, WADE-8013/WADE-8014 supports ATX only. Therefore, there is no other setting that really needs to be set up. However, there are only two connectors that must be connected—J22 (4 pins CPU +12V main power connector) & J15 (24 pins ATX Power Connector) Figure.



Serial ATA Hard Disk Setting for IDE/AHCI/RAID

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time; there are total four connectors, J17, J18, J23, and J24. The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation. All you need to operate IDE or AHCI or RAID application for system, please follow up setting guide in BIOS programming (Table 5-1); Furthermore, you can consult chapter 4.3 Configuration "SATA Configuration" part of the" SATA Mode".

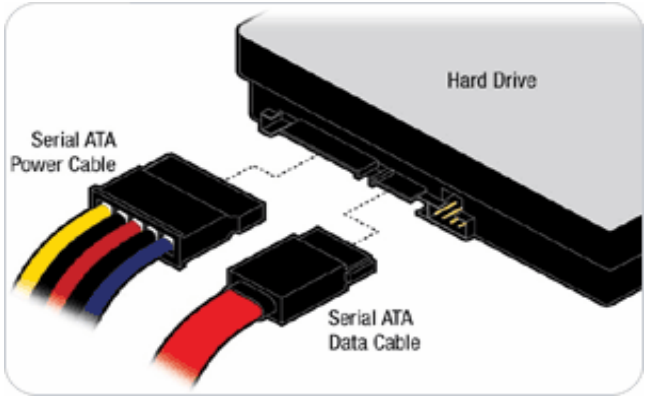


Table. 5-1 SATA Mode setting guide

System BIOS Main Menu

Configuration

SATA Configuration …….…… [Press enter]

SATA Mode…… [IDE/AHCI/RAID]

The J23 and J24 (Blue connector) SATA connectors can support SATA 3.0 hard disk.

5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. 240-pin DDR3 Memory, keyboard, mouse, SATA hard disk, VGA connector, device power cables, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with WADE-8013/WADE-8014, it is recommended, when going with the boot-up sequence, to hit "F2" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "**Load Setup Defaults**", press **"Enter**" and select **"Yes"** to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Improper Disable Operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the Serial Port1/ Serial Port 2 ports, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

Disable Serial Port1 to release IRQ #4
Disable Serial Port2 to release IRQ #3
Etc…

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	**System Timer**
IRQ #1	**Keyboard Event**
IRQ #2	**Usable IRQ**
IRQ #3	**COM2**
IRQ #4	**COM1**
IRQ #5	**Usable IRQ**
IRQ #6	**Diskette Event**
IRQ #7	**Usable IRQ**
IRQ #8	**Real-Time Clock**
IRQ #9	**Usable IRQ**
IRQ #10	**Usable IRQ**
IRQ #11	**Usable IRQ**
IRQ #12	**IBM Mouse Event**
IRQ #13	**Coprocessor Error**
IRQ #14	**Hard Disk Event**
IRQ #15	**Usable IRQ**

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

5.3 Q&A

Information & Support

Question: I forget my password of system BIOS, what am I supposed to do?

Answer: You can switch off your power supply then find the JP6 to set it from 1-2 short to 2-3 short and wait 5 seconds to clean your password then set it back to 1-2 short to switch on your power supply.

Question: How to update the BIOS file of the WADE-8013/WADE-8014?

Answer: 1. Please visit web site of the Portwell download center as below hyperlink and register an account. **(The E-Mail box should be an existing Company email address that you check regularly.)**
http://www.portwell.com.tw/member/newmember.php

2. Input your User name and password to log in the download center.
3.Select the "Search download" to input the keyword"WADE-8013 /WADE-8014
4. Find the "BIOS "page to download the ROM file and flash utility.

5. Execute the zip file to root of the bootable USB pen drive which can boot to DOS mode.
6. Insert your bootable USB pen drive in WADE-8013/WADE-8014 board and power-on.
7. Boot to DOS mode then input the "Update" command to start to update BIOS process.
8. Switch "Off" the Power Supply when you finished the update process.
9. Wait 5 seconds then switch "ON" the Power Supply then press the "F2" Key to BIOS to select "Load Setup Defaults" and then select "Exit Saving Changes" option.

Note:
Please visit our technical web site at http://www.portwell.com.tw
For additional technical information, which is not covered in this manual, you can mail to tsd@mail.portwell.com.tw or you can also send mail to our sales, they will be very delighted to forward them to us.

System Memory Address Map
Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used for your reference.

Memory Area	Size	Device Description
0000-003F	1K	Interrupt Area
0040-004F	0.3K	BIOS Data Area
0050-006F	0.5K	System Data
0070-0E2E	54K	DOS
0E2F-0F6B	5K	Program Area
0F6C-9D7F	568K	【Available】
First Meg	= Conventional memory ends at 630K =	
9D80-9DFF	2K	Extended Bios Area
9E00-9FFF	8K	Unused
A000-AFFF	64K	VGA Graphics
B000-B7FF	32K	Unused
B800-BFFF	32K	VGA Text
C000-CE5F	57K	Video ROM
CE60-EFFF	134K	Unused
F000-FFFF	64K	System ROM
HMA	64K	First 64k Extended

Interrupt Request Lines (IRQ)

Peripheral devices can use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Interrupt Request Lines IRQ		
IRQ#	***Current Use***	***Default Use***
IRQ 0	**System ROM**	**System Timer**
IRQ 1	**System ROM**	**Keyboard Event**
IRQ 2	**【Unassigned】**	**Usable IRQ**
IRQ 3	**System ROM**	**COM2**
IRQ 4	**System ROM**	**COM1**
IRQ 5	**【Unassigned】**	**Usable IRQ**
IRQ 6	**System ROM**	**Diskette Event**
IRQ 7	**Unused**	**Usable IRQ**
IRQ 8	**System ROM**	**Real-Time Clock**
IRQ 9	**【Unassigned】**	**Usable IRQ**
IRQ 10	**【Unassigned】**	**Usable IRQ**
IRQ 11	**【Unassigned】**	**Usable IRQ**
IRQ 12	**System ROM**	**IBM Mouse Event**
IRQ 13	**System ROM**	**Coprocessor Error**
IRQ 14	**System ROM**	**Hard Disk Event**
IRQ 15	**【Unassigned】**	**Usable IRQ**

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0050-006F	0.5K	System Data
0070-0E2E	54K	DOS
0E2F-0F6B	5K	Program Area
0F6C-9BFF	562K	【Available】
= Conventional memory ends at 624K =		
9C00-9D3F	5K	Extended Bios Area
9D40-9FFF	11K	Unused
A000-AFFF	64K	VGA Graphics
B000-B7FF	32K	Unused
B800-BFFF	32K	VGA Text
C000-CD7F	54K	Video ROM
CD80-EFFF	138K	Unused
F000-FFF	64K	System ROM
HMA	64K	First 64k Extended

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IRQ 7	【Unassigned】	Usable IRQ
IRQ 8	System ROM	Real-Time Clock
IRQ 9	【Unassigned】	Usable IRQ
IRQ 10	【Unassigned】	Usable IRQ
IRQ 11	Video ROM	Usable IRQ
IRQ 12	System ROM	IBM Mouse Event

IRQ 13	System ROM	Coprocessor Error
IRQ 14	System ROM	Hard Disk Event
IRQ 15	【Unassigned】	Usable IRQ